"A PROSPECTIVE AND RANDOMIZED STUDY COMPARING ULTRASOUND GUIDED AND LAND MARK BASED TECHNIQUE FOR SUPERFICIAL CERVICAL PLEXUS BLOCK IN PATIENTS UNDERGOING THYROID SURGERY"

Dissertation submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

In partial fulfilment for the award of the degree of

DOCTOR OF MEDICINE

IN

ANAESTHESIOLOGY

BRANCH X

INSTITUTE OF ANAESTHESIOLOGY AND CRITICAL CARE

MADRAS MEDICAL COLLEGE

CHENNAI- 600003

APRIL 2016

CERTIFICATE OF THE GUIDE

This is to certify that the dissertation titled , **"A PROSPECTIVE AND RANDOMIZED STUDY COMPARING ULTRASOUND GUIDED AND LAND MARK–BASED TECHNIQUE FOR SUPERFICIAL CERVICAL PLEXUS BLOCK IN PATIENTS UNDERGOING THYROID SURGERY"** is a bonafide research work done by Dr.Prakash V in partial fulfilment of the requirement for the degree of DOCTOR OF MEDICINE in Anaesthesiology.

PROF Dr.ANANTHAPPAN,MD,DA

Institute of Anaesthesiology & Critical care

Madras medical college

Chennai-600003

Date:

Place

CERTIFICATE

This is to certify that the dissertation titled, **"A PROSPECTIVE AND RANDOMIZED STUDY COMPARING ULTRASOUND GUIDED AND LANDMARK–BASED TECHNIQUE FOR SUPERFICIAL CERVICAL PLEXUS BLOCK IN PATIENTS UNDERGOING THYROID SURGERY"** Submitted by Dr.Prakash V in partial fulfilment for the award of the degree of DOCTOR OF MEDICINE in Anaesthesiology by The Tamilnadu Dr.M.G.R Medical University, Chennai is a bonafide record of work done by him in the INSTITUTE OF ANAESTHESIOLOGY& CRITICAL CARE, ," Madras Medical College, during the academic year 2013 -2016 .

PROF DR. B.KALA M.D, D.A
Professor and Director ,
Institute of Anaesthesiology
and Critical care
Madras Medical College,
Chennai – 03

DR .R. VIMALA M.D
The Dean
Madras medical college
Chennai – 600 003

DECLARATION

I hereby declare that the dissertation titled, **"A PROSPECTIVE AND RANDOMIZED STUDY COMPARING ULTRASOUND GUIDED AND LAND MARK –BASED TECHNIQUE FOR SUPERFICIAL CERVICAL PLEXUS BLOCK IN PATIENTS UNDERGOING THYROID SURGERY"** Has been prepared by me under the guidance of **Prof.Dr.Ananthappan ,MD,DA**, Professor of Anaesthesiology, Institute of Anaesthesiology & Critical care, Madras Medical college, Chennai, in partial fulfillment of the regulations for the award of the degree of M.D (Anaesthesiology),examination to be held in April 2016.

This study was conducted at Institute of Anaesthesiology & Critical care, Madras Medical College, Chennai.

I have not submitted this dissertation previously to any journal or any university for the award of any degree or diploma.

Date:

Place: Chennai Dr.Prakash V

ACKNOWLEDGEMENT

I am extremely thankful **to Dr.R.Vimala MD** ,the Dean, Madras Medical College, for her permission to carry out this study.

I am immensely thankful and indebted to **Prof.Dr.B.Kala, MD,DA,** the Director and Professor, Institute of Anaesthesiology &Critical care, for her concern ,guidance and support in conducting this study.

I am extremely thankful to **Prof .Dr. Ananthappan MD,DA**, for his concern ,inspiration, meticulous guidance, expert advice and constant encouragement in doing this study.

I am immensely thankful to **Dr.A. Ganesh , MD**, for her valuable suggestions and constant motivation in doing my study.

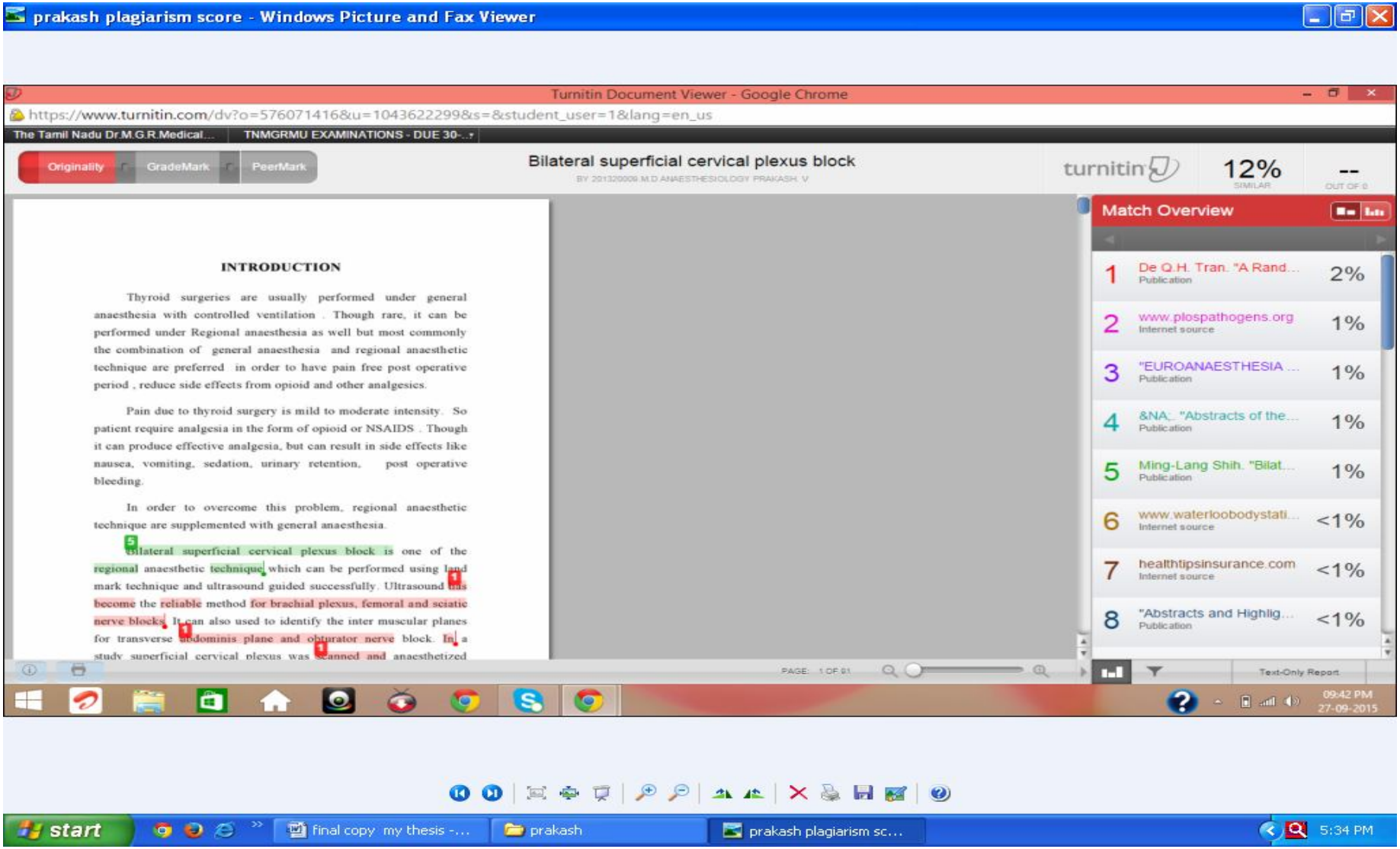
I am extremely thankful to **Dr.B.Mariam shirin, M.D , Dr.S.Bhuvana M.D, Dr.D.Shunmuga priya M.D** for their support in carrying out this study.

I am thankful to institutional ethics committee for the approval and guidance for this study.

I am thankful to all my colleagues and friends for their help and advice in carrying out this study.

I am grateful to my family members and friends for their moral support and encouragement.

Lastly I am extremely thankful to Almighty and all the patients and family members for willingly submitting themselves for my study


prakash plagiarism score - Windows Picture and Fax Viewer
Turnitin Document Viewer - Google Chrome
https://www.turnitin.com/dv?o=576071416&u=1043622299&s=&student_user=1&lang=en_us
The Tamil Nadu Dr.M.G.R.Medical...
TNMGRMU EXAMINATIONS - DUE 30-...
Originality
GradeMark
PeerMark
Bilateral superficial cervical plexus block
turnitin
12%
SIMILAR
--
OUT OF 0
INTRODUCTION
Thyroid surgeries are usually performed under general anaesthesia with controlled ventilation . Though rare, it can be performed under Regional anaesthesia as well but most commonly the combination of general anaesthesia and regional anaesthetic technique are preferred in order to have pain free post operative period , reduce side effects from opioid and other analgesics.
Pain due to thyroid surgery is mild to moderate intensity. So patient require analgesia in the form of opioid or NSAIDS . Though it can produce effective analgesia, but can result in side effects like nausea, vomiting, sedation, urinary retention, post operative bleeding.
In order to overcome this problem, regional anaesthetic technique are supplemented with general anaesthesia.
Bilateral superficial cervical plexus block is one of the regional anaesthetic technique which can be performed using land mark technique and ultrasound guided successfully. Ultrasound has become the reliable method for brachial plexus, femoral and sciatic nerve blocks. It can also used to identify the inter muscular planes for transverse abdominis plane and obturator nerve block. In a study superficial cervical plexus was scanned and anaesthetized
Match Overview
1 De Q.H. Tran. "A Rand... Publication 2%
2 www.plospathogens.org Internet source 1%
3 "EUROANAESTHESIA ... Publication 1%
4 &NA;. "Abstracts of the... Publication 1%
5 Ming-Lang Shih. "Bilat... Publication 1%
6 www.waterloobodystati... Internet source <1%
7 healthtipsinsurance.com Internet source <1%
8 "Abstracts and Highlig... Publication <1%
Text-Only Report
09:42 PM
27-09-2015
start
final copy my thesis -...
prakash
prakash plagiarism sc...
5:34 PM

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	201320009.md Anaesthesiology P...
Assignment title:	TNMGRMU EXAMINATIONS
Submission title:	Bilateral superficial cervical plexus ...
File name:	final_copy_my_thesis.doc
File size:	2.34M
Page count:	91
Word count:	8,899
Character count:	44,810
Submission date:	27-Sep-2015 07:40PM
Submission ID:	576071416

INTRODUCTION

Thyroid surgeries are usually performed under general anaesthesia with controlled ventilation. Though rare, it can be performed under Regional anaesthesia as well but most commonly the combination of general anaesthesia and regional anaesthetic techniques are preferred in order to have pain free post operative period , reduce side effects from opioid and other analgesics.

Pain due to thyroid surgery is mild to moderate intensity. So patient requires analgesia in the form of opioid or NSAIDS. Though it can produce effect in analgesia, but can result in side effects like nausea, vomiting, sedation, urinary retention, post operative bleeding.

In order to overcome this problem, regional anaesthetic techniques are supplemented with general anaesthesia.

Bilateral superficial cervical plexus block is one of the regional anaesthetic technique which can be performed using land mark technique and ultrasound guided successfully. Ultrasound has become the reliable method for brachial plexus, femoral and sciatic nerve blocks. It can also used to identify the inter muscular planes for transversus abdominis plane and obturator nerve block. In a study superficial cervical plexus was scanned and anaesthetized between the sternocleidomastoid and scalenus muscles successfully.

Dr. G.V. Vani and Shailaja conducted a study which compares landmark technique and ultrasound guided technique for superficial cervical plexus block. This study concludes lower complications may,

ABSTRACT

Background :

Superficial cervical plexus block is one of the regional anaesthetic technique that can provide post operative analgesia for thyroid surgery. This Prospective , Randomized double blinded study compared ultrasound guided and landmark technique for superficial cervical plexus block in thyroid surgery.

Methods

Sixty patients were randomly allocated to receive the superficial cervical plexus block using ultrasound guided (n=30) and landmark technique (n=30) .The main outcome , success of the technique was defined as absence of cold sensation for all 4 branches of the superficial cervical plexus at 15 mins. A blinded also observed onset time , performance time , block pain score, Intra operative haemodynamics, postoperative pain score , and complication

Results

The success rate was 83 % in Ultrasound guided group and 67% in landmark technique group. Ultrasound guided results in faster onset time , longer performance time than landmark group.

Conclusion

Ultrasound guided technique results in higher success rate , faster onset time, and longer performance time as compared to landmark technique group.

keywords: superficial cervical plexus block, Ultrasound guided, Landmark technique

INTRODUCTION

Thyroid surgeries are usually performed under general anaesthesia with controlled ventilation .But most commonly the combination of general anesthesia with regional anesthetic technique is preferred in order to have intra operative hemodynamic stability , good recovery , pain free post operative period , thereby reduce side effects from opioid and other analgesics.

Pain due to thyroid surgery is mild to moderate intensity. So patient require analgesia in the form of opioid or NSAIDS . Though it can produce effective analgesia, but can result in side effects like nausea, vomiting, sedation, urinary retention, and post operative bleeding.

In order to overcome this problem, regional anesthetic technique is supplemented with general anaesthesia.

Bilateral superficial cervical plexus block is one of the regional anesthetic technique which can be performed using land mark technique and ultrasound guided technique. Ultrasound has become the reliable method for brachial plexus, femoral and sciatic nerve blocks. It can also used to identify the inter muscular planes for transverse abdominis plane and obturator nerve block. A study done by De Q.H Tran and Shubada, superficial cervical plexus was visualized and

anaesthetized between the sternocleidomastoid and scalene muscles successfully.

De Q.H Tran and Shubada conducted a study which compare landmark technique and ultrasound guided technique for superficial cervical plexus block. This study conclude better block, lower complication rate, when using ultrasound guided as compared to land mark technique.

This present study was done in patients undergoing total thyroidectomy to compare Ultrasound - Guided and Landmark technique for superficial cervical plexus block.

AIMS AND OBJECTIVES OF THE STUDY

To compare Ultrasound-guided and Landmark based technique for superficial cervical plexus block in patients undergoing thyroid surgeries with respect to

- Success of technique
- Onset time
- Performance time
- Block pain score
- Intra operative hemodynamics
- Post operative pain score
- Complications

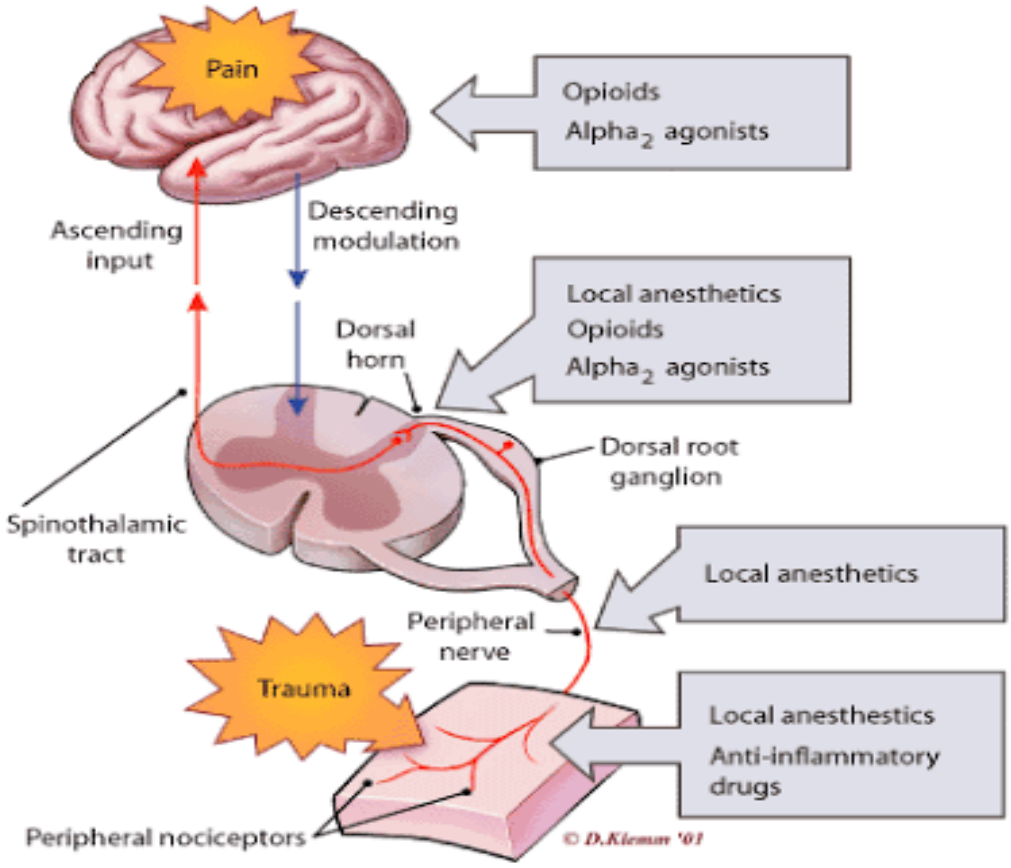
PAIN

The term ‘Pain’ means penalty derived from the term “Poena” . It is defined as “unpleasant emotional and sensory experience associated with potential or actual tissue damage or described in terms of such damage.

It is proved that pain can result in severe stress response , and can be perceived by all group of age including preterm baby also.

PAIN PATHWAY

- The noxious stimuli at the time of injury produces local inflammatory response in the periphery. It results in sensitization of nociceptors and primary hyperalgesia.
- Then the noxious impulse is transmitted to CNS by A delta and C fibres . This will initiate the sequence of events. i.e reflex withdrawal from the stimulus, aversive behaviour and pain perception
- The noxious impulse from the C fibres produces central sensitization which will alter the sensory processing in spinal cord . This result in allodynia and hyperalgesia at the site of injury .



DRUGS ACTS AT VARIOUS SITES OF PAIN PATHWAY

- Periphery : Local anaesthetics , NSAIDS , and opioids
- Spinal cord : Local anaesthetics, opioids and alpha 2agonist
- Cortical : Opioids

Pain can be approached with various types of drugs and combined approach is employed for effective pain relief.

Regional anaesthesia is one of most efficient method of pain relief and it has the several advantages over others. They are:

- Regional anaesthesia reduces general anaesthetic requirement considerably
- More rapid recovery
- Decreased requirement of intra operative and post operative opioid and other analgesic drugs.
- Reduced incidence of post operative nausea and vomiting
- Earlier discharge and thereby reduces the cost
- Compliance is good
- Regional anaesthesia avoids undesirable autonomic reflexes like Laryngospasm.
- Regional blocks ensures adequate muscle relaxation , so the use of muscle relaxant is minimized, early recovery, decreased incidence of respiratory insufficiency
- Intra operative and post operative bleeding is reduced
- Decreased stress response
- Cardiovascular stability is well maintained
- Adequate pain relief reduces pulmonary complication
- Reduced incidence of post operative ventilator support

ASSESSMENT OF PAIN

Pain is a subjective phenomenon unique to the individual. Unlike chronic pain, acute pain is easy to assess and it reflects the actual tissue damage.

In the post operative period, level of pain due to surgery changes rapidly over a period of time. So the assessment of pain should be done by using simple measurement tools, so that pain treatment can be appropriately titrated pain is considered as the " fifth vital sign".

Accurate assessment of pain is mandatory to make sure that the pain is managed effectively[27].

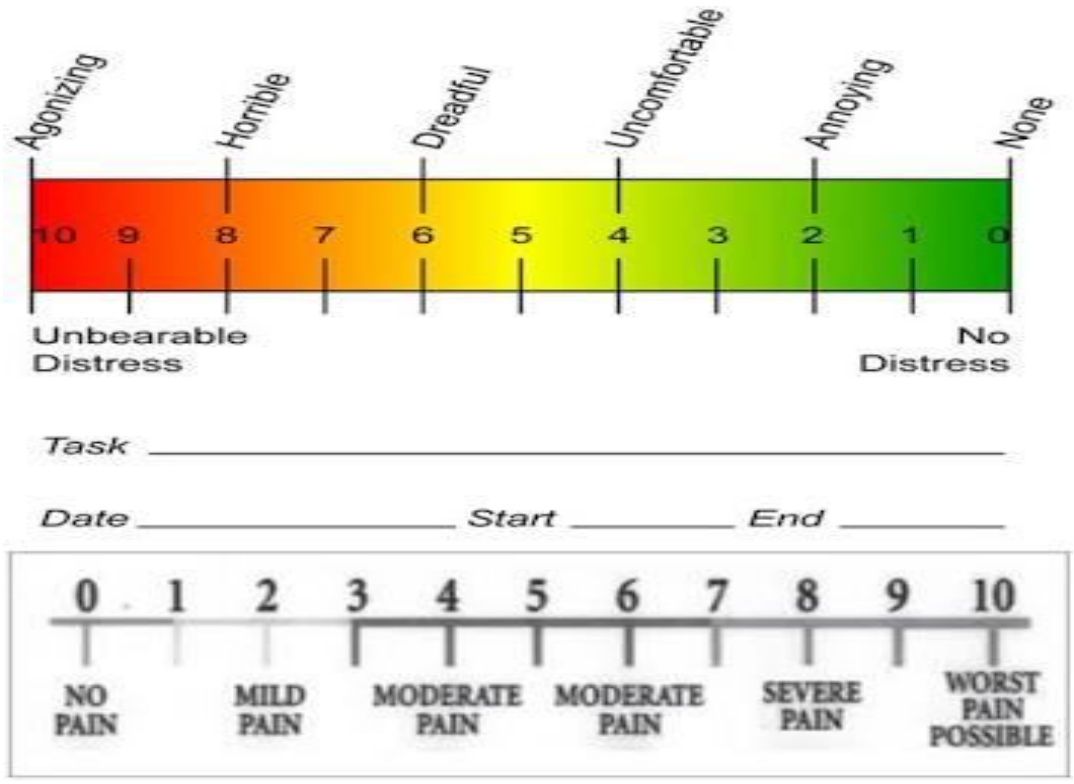
TOOLS FOR EVALUATION OF PAIN

Numerous pain scoring system are available to assess the pain severity.

1) Numerical scale : This is 11 point scale system consist of score of 0 to 10 . 0 means no pain , 10 means worst imaginable pain.

2) Categorical : It consist of four or five point scaling system. The pain will be graded as none, mild , moderate , severe and excruciating . The disadvantage is , it lacks sensitivity , but advantage is , its simplicity

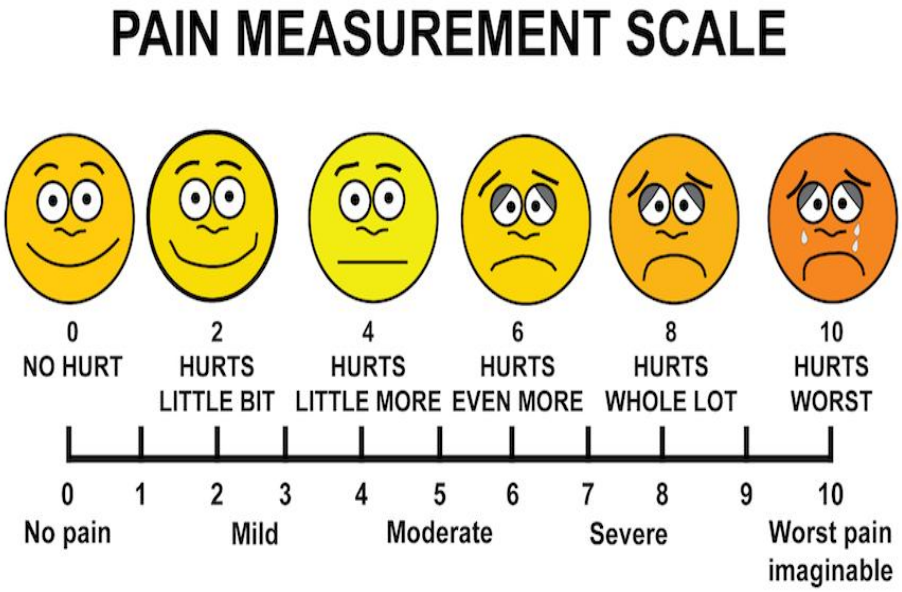
3) Visual Analogue Scale (VAS) : It is most commonly used for pain assessment. It consist of 100 mm scale. At one end , there is no pain, at other end worst imaginable pain.



4) Mc Gill Pain Questionnaire (MPQ) : It measures the pain in multi- dimensional aspects. It measures affective , evaluative sensory and other aspects of pain and it consist of 20 questionnaires.

1 – 10	:	Sensory aspect of pain
11 – 15	:	Affective aspect of pain
16	:	Evaluative aspect of pain
17 – 20	:	Miscellaneous aspect of pain

5) Happy – Sad face: A set of faces shown to a child or illiterate person to indicate his pain. The person will be asked to select the facial expression that suits for his pain . In this way pain can be assessed.



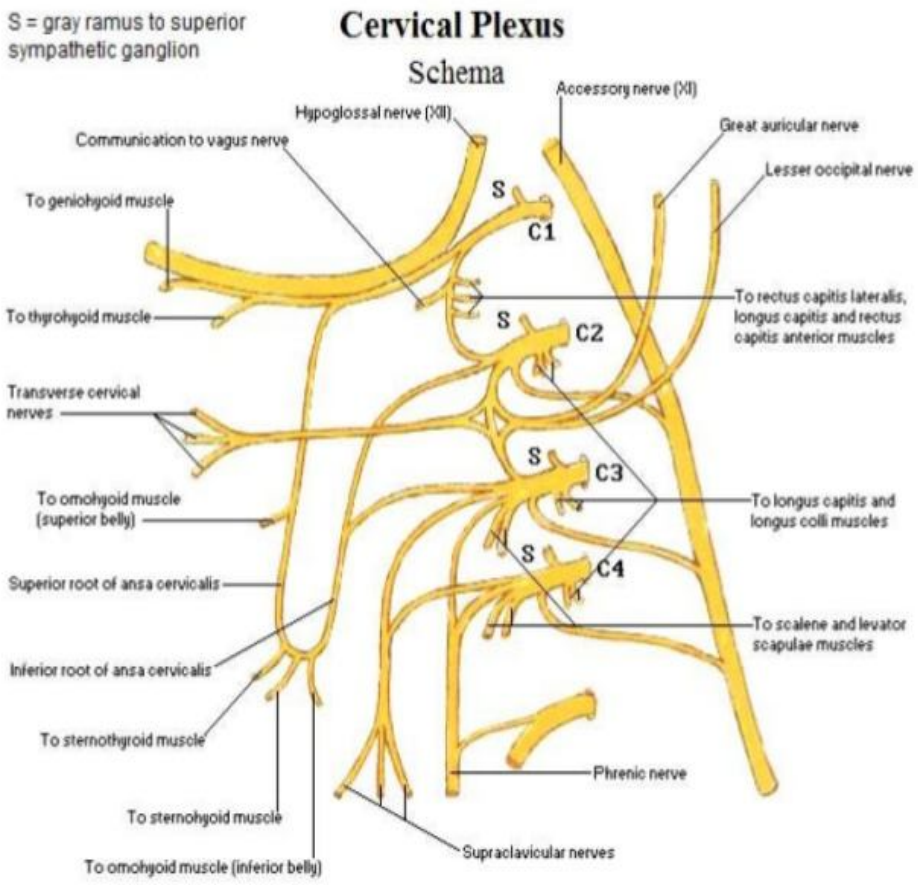
CERVICAL PLEXUS

FORMATION

The cervical plexus is formed by the ventral rami of the upper four cervical nerves. The ventral rami emerge between the anterior and posterior tubercle the cervical transverse process. All rami divide into two except first cervical nerve[3].

POSITION

The plexus is anteriorly related to prevertabral fascia, internal jugular vein and sternocliedo mastoid muscles. Posteriorly related to muscles which arises from the posterior tubercle of the transverse process. i.e levator scapulae and scalenus medius



SUPERFICIAL BRANCHES

It emerges at the superficial fascia of the neck at mid portion of the posterior border of the sternomastoid muscles. Its branches are

1) Lesser occipital nerve which ascends up and supplies the skin of the upper portion of neck region and behind auricle.

2) Great auricular nerve which ascends across sternomastoid muscle and supplies the skin over the parotid region

3) Transverse cervical nerve crosses sterno mastoid muscles horizontally and supplies the skin over the anterior triangle.

4) Supra clavicular nerve (C3. C4) descends behind the sterno mastoid muscle and supply over the skin of the shoulder and upper pectoral region.

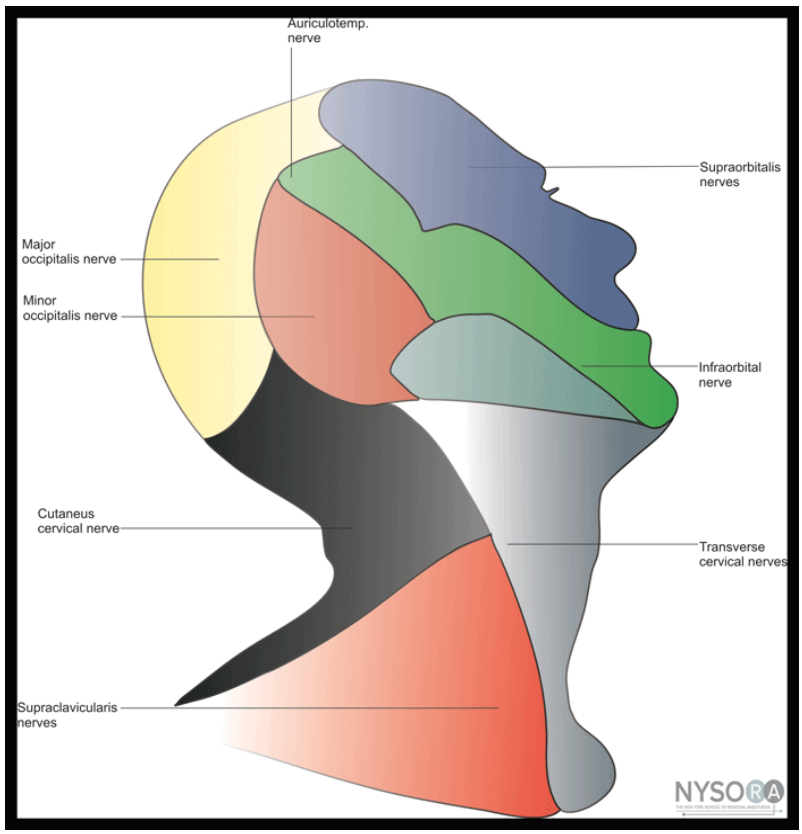
DEEP BRANCHES

1) Muscular branches supplies muscles of the neck and phrenic nerve which supplies diaphragm.

2) Communicating branch

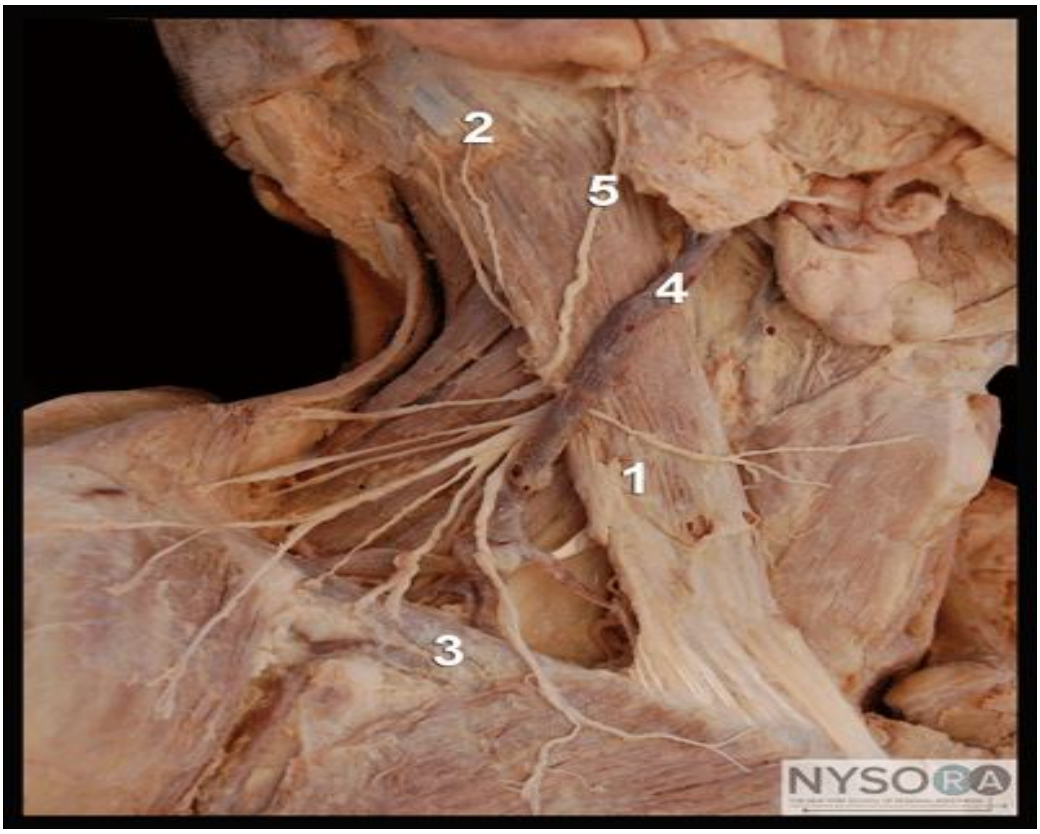
SUPERFICIAL CERVICAL PLEXUS

The superficial cervical plexus arises from the anterior rami of the C2 through C4 and emerge at the mid portion of the posterior border of the sternomastoid muscles as four distinct nerves which supplies skin over the anterolateral aspect of the neck region.[3]



The lesser occipital nerve comes from stem of C2 where as greater auricular and transverse cervical derived from part of C3.

The remaining part of C3 joins with major part of C4 give rise to supraclavicular trunk which further divide in to upper, middle and lower supra clavicular nerve[12]



Ascending branches are

1) Occipital nerve

2) Superficialis coli

3) Auricular magnus

4) Suprasternal nerve

Descending branches are

1) Supraclavicular nerve

2) Supra acromial

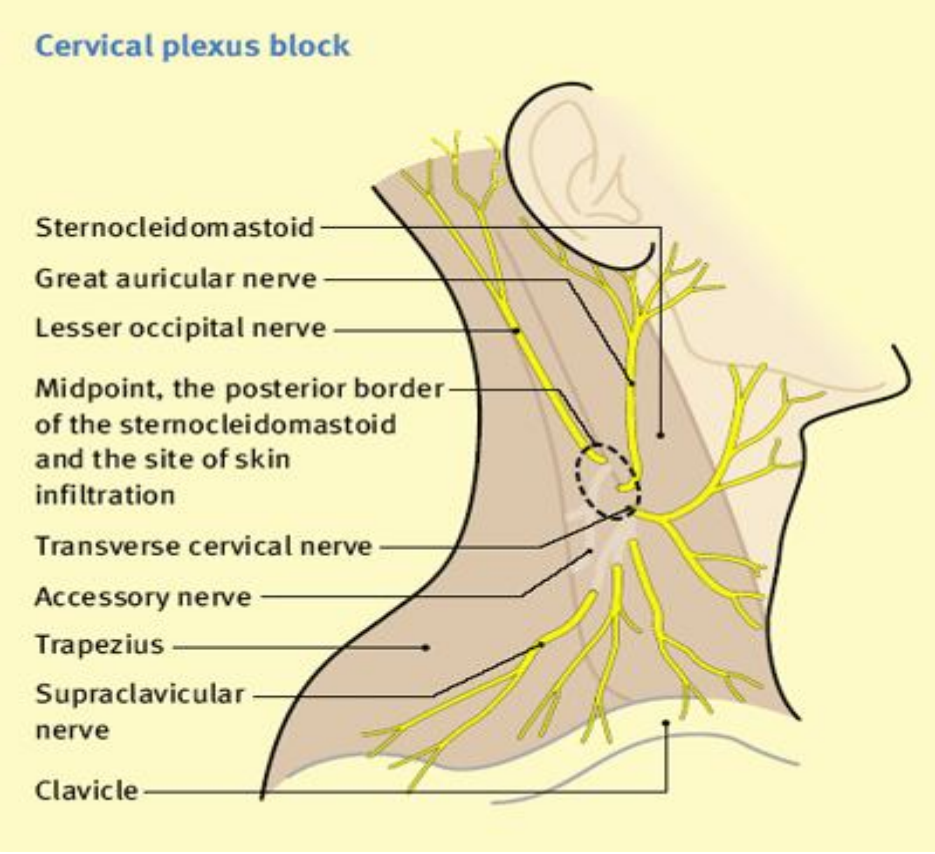
SUPERFICIAL CERVICAL PLEXUS BLOCK

INDICATION

- Carotid endarterectomy
- Superficial neck surgery
- Central venous catheterization

TECHNIQUE

- Landmark technique
  - Two point technique
  - Three point technique
- Ultra sound guided technique



LANDMARK TECHNIQUE

The patient is in supine position and neck turned slightly to opposite side , and landmark is identified as mid portion of the posterior border of the sternomastoid muscle.

It consist of subcutaneous injection of local anaesthetic along the posterior border of the sterno mastoid muscle just under the skin[6].

1) TWO POINT TECHNIQUE

A line drawn between the mastoid process and chassaignac's tubercle of C6 transverse process. At the mid point of this line, 25 G block needle is inserted , skin wheal is raised and the needle is directed cephalad towards the mastoid process along the posterior border of sterno mastoid muscle. 3 to 4 ml of local anaesthetic is injected in a subcutaneous plane as the needle is withdrawn. Care must be taken to avoid piercing the external jugular vein. Then the needle is directed towards the clavicle and same amount of local anesthetic is injected in a subcutaneous plane while withdrawing the needle.

2) THREE POINT TECHNIQUE

In this technique, the land mark used is posterior border of the sternocleido mastoid muscle 2 cm above the clavicle. 10 ml local anaesthetic preparation is used, and depth of injection is less than 5 cm. Now 2 ml of local anaesthetic is injected at the site of needle entry, 6ml in the cephalad direction and another 2 ml in the transverse direction.

COMPLICATION

1) Vascular puncture and local anaesthetic toxicity

2) Infection

3) Haematoma formation

4) Brachial plexus block

5) Phernic nerve palsy

6) Horner syndrome

ULTRASOUND GUIDED TECHNIQUE

The aim of ultrasound – guided superficial cervical plexus is to increase the success of the block by depositing the local anaesthetic as close to the sensory branches of cervical plexus. By using ultrasound guided technique , one can ensure the spread of local anaesthetic in the correct inter muscular plane , which will not only increase the success of the technique , but also avoid too deep needle insertion and thereby preventing injury to neighboring structure , vascular deposition. Both in – plane and out- plane technique can be used successfully[34].

INDICATION

- Carotid endarterectomy
- Superficial neck surgery
- Central venous catheterization

EQUIPMENT

1) Nerve block tray
2) Sterile glove
3) Ultrasound machine with linear probe
4) 10 ml syringes – 2
5) Spinal needle – 23 G , 25 G

ULTRASOUND GUIDED TECHNIQUE

Patient is positioned in lateral aspect with operative side upper most. The skin is disinfected. The mid portion of the posterior border of the sternocleido mastoid muscle was scanned using high frequency linear probe. The inter muscular plane is identified between the sternomastoid and scalene muscle. 1- 2 ml of local anaesthetic is injected to confirm the proper position and after negative aspiration, 10 ml of local anaesthetic mixture is deposited in the desired inter muscular plane[33] .

ADVANTAGE

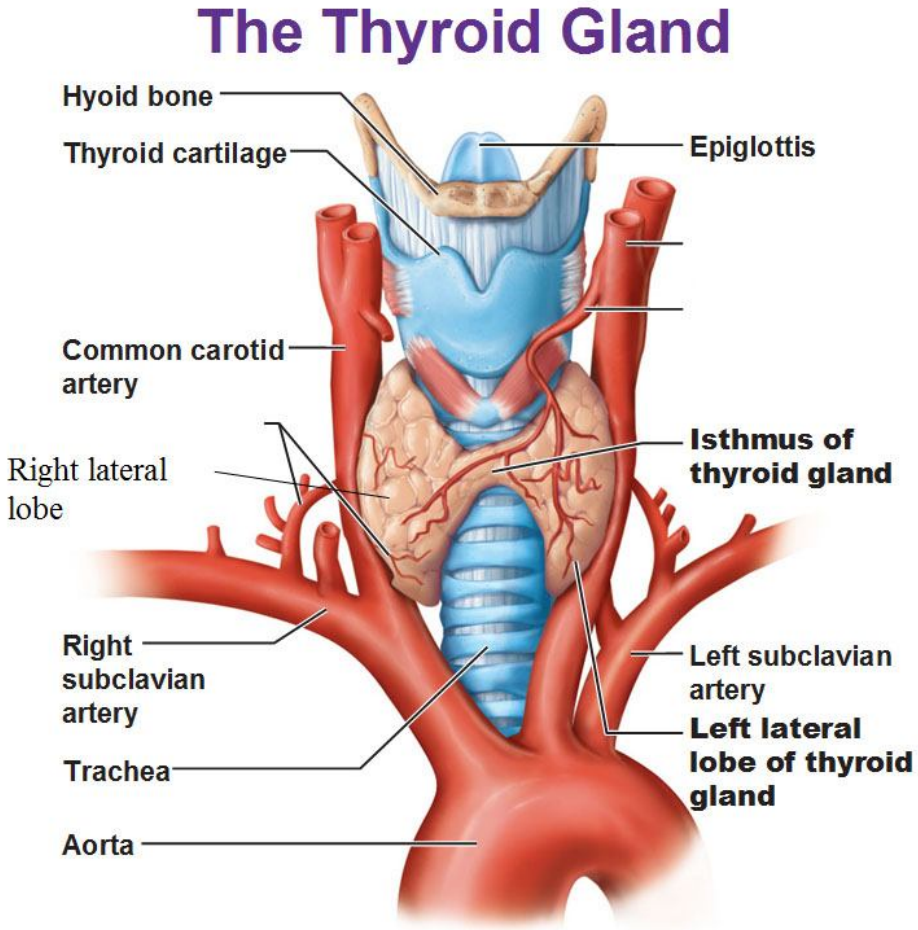
1) Increases the success of block

2) Avoid deeper insertion and inadvertent injection in to the important surrounding structure.

THYROID GLAND

ANATOMY

Thyroid gland is an endocrine organ , situated in the lower part of the neck opposite to vertebrae C5 , C6 , C 7 and T1 . It is butterfly in shape and consist of right and left lobe and joined together by isthmus A third pyramidal lobe projects upwards from the isthmus. The upper pole of the thyroid gland is pointed, and the lower pole is rounded and broad[3].



Gross anatomy of the thyroid gland, anterior view

It extends from the middle of the thyroid cartilage to 4th or 5th tracheal rings . The isthmus extend from the 2nd to 3rd tracheal ring.

Accessory thyroid gland may sometime be present as small detached masses in the vicinity of lobes or above the isthmus.

It mainly regulates the basal metabolic rate, stimulates somatic And psychic growth. It also plays a important role in calcium metabolism

CAPSULES OF THYROID GLAND

1) True capsule : It is the peripheral condensation of the connective tissue of the thyroid gland

2) False capsule : It is derived from pre tracheal layer of the deep cervical fascia

Since there is a presence of dense capillary plexus deep to the true capsule, to avoid bleeding during thyroidectomy, thyroid gland is removed along with the true capsule[3].

DIMENSIONS AND WEIGHT

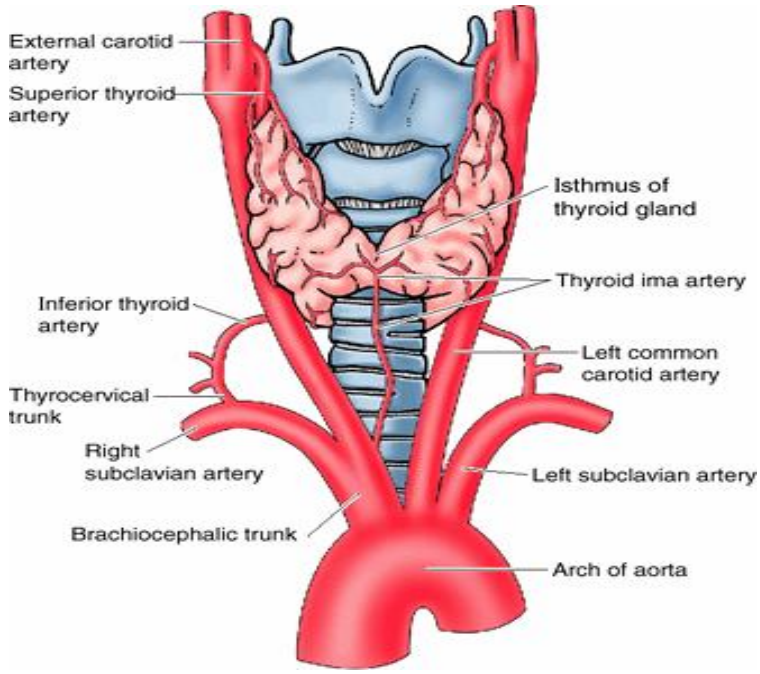
Each lobe measures about 5cm*2.5cm*2.5cm, and isthmus measures about 1.2cm*1.2cm. The average weight of the gland is 25g. The gland is slightly larger in female than male. During menstruation and pregnancy, the gland increases in size.

ARTERIAL SUPPLY

1) ***Superior thyroid artery*** : Is a branch of external carotid artery and divided in to anterior and posterior branches. It supplies anterior and posterior lobes of thyroid respectively.

2) ***Inferior thyroid artery*** : a branch from the thyrocervical trunk which itself is a branch of subclavian artery.

3) ***Thyroidea ima artery*** : a branch from brachio cephalic trunk or directly from the aorta Accessory thyroid arteries which also supplies thyroid gland and arises from the tracheal and esophageal arteries.



VENOUS DRAINAGE

1) Superior thyroid vein drains in to internal jugular or in the common facial vein.

2) The middle thyroid vein also drains into internal jugular vein.

3) The inferior thyroid vein drains in to brachio cephalic vein

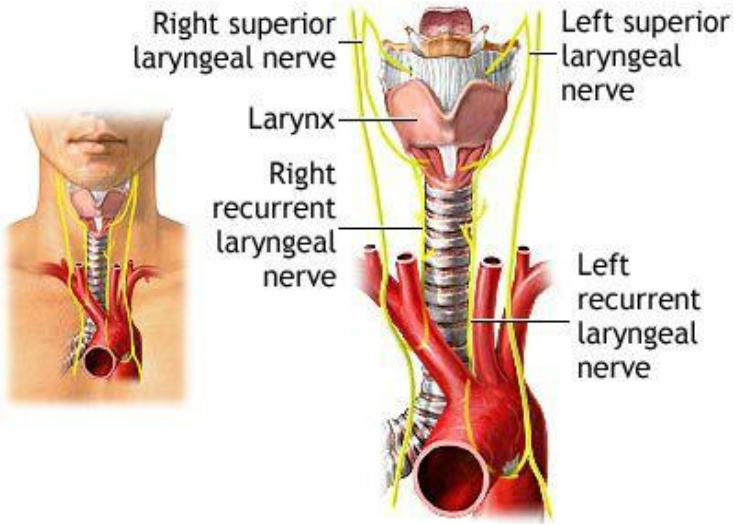
4) A fourth thyroid vein known as kohers vein may be lies between middle and inferior thyroid vein and drains in to the internal jugular vein.

LYMPHATIC DRAINAGE

1) Lymphatics from the upper part of the gland drain in to upper deep cervical nodes directly or through the pre laryngeal nodes.

2) Lymphatics from the lower part of the gland either directly drain in to lower deep cervical nodes or through the pre tracheal and paratracheal nodes..

NERVE SUPPLY



Thyroid gland is mainly supplied from the middle cervical ganglion and also partly from the superior and inferior cervical ganglion.

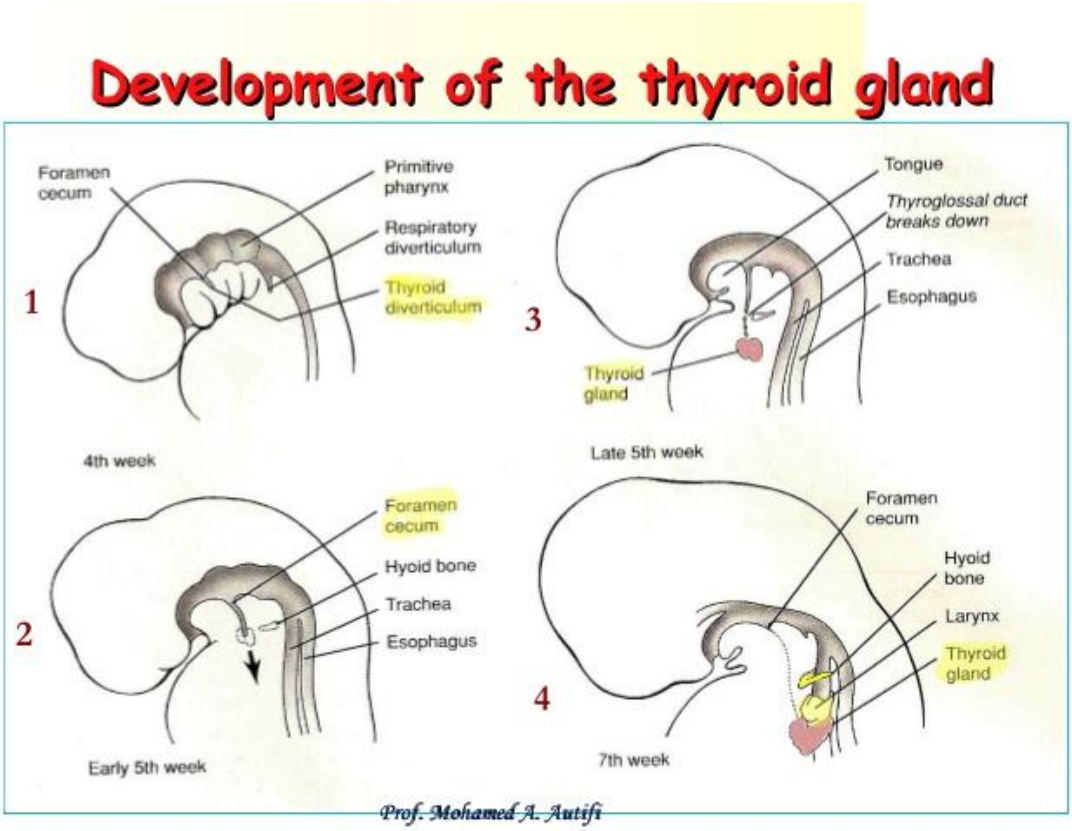
STRUCTURE AND FUNCTION

The thyroid gland consist of two types of secretory cells.

1) Follicular cells : It lines the follicles of the thyroid gland and secrete tri iodo thyronin and tetra iodo thyronin . It stimulates the basal metabolic rate and somatic psychic growth of an individual.

2) Parafolicular cells : It lies in between the follicles. They secrete calcitonin which promotes calcium deposition in bones and other tissues[11].

DEVELOPMENT



The thyroid gland developed from a median endodermal diverticulum which grows in front of the neck and the floor of the primitive pharynx , just caudal to the tuberculum impar. The lower end of the diverticulum enlarges to form the gland. The rest of the diverticulum remains narrow and is known as the thyroglossal duct[4].

THYROID ENLARGEMENT

Generalized enlargement of the thyroid gland is known as goiter

CLASSIFICATION

Simple Goiter

- Multi nodular goiter
- Diffuse hyperplastic

Toxic

- Diffuse
- Toxic adenoma
- Multinodular

Neoplastic

- Benign
- Malignant

Inflammatory

- Autoimmune

- Hashimoto's thyroiditis
- Chronic lymphocytic thyroiditis
- Granulomatous
- Riedel's thyroiditis

Indication for surgery in thyroid swelling

- Pressure symptoms
- Cosmetic purpose
- Toxic adenoma
- Neoplasia

THYROID OPERATION

1) Lobectomy = Unilateral total lobectomy + isthmusectomy

2) Subtotal thyroidectomy = Bisubtotal lobectomy + isthmusectomy

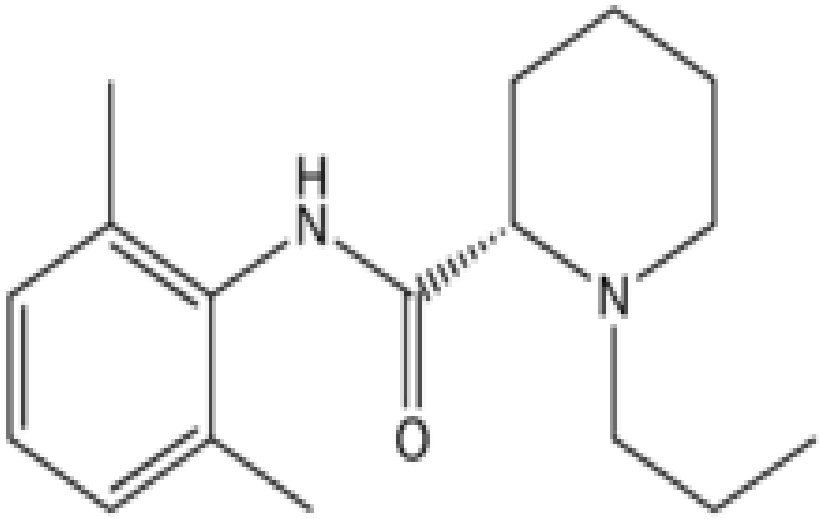
3) Total thyroidectomy = Bi total lobectomy + isthmusectomy[4]

BUPIVACAINE

Bupivacaine is a long acting local anaesthetic belongs to amide group.

Its chemical name is 1-butyl 2, 6 dimethyl phenylpiperadine 2 – carboxamide hydrochloride . The aromatic head and hydrocarbon are linked by an amide bond rather than ester. As a result , they are more stable and results in less chance of allergic reaction. It was synthesized first by Ekenstam in 1957 and first used by widmon and Telimo in 1963[29].

CHEMICAL STRUCTURE



Mechanism of Action

Its acts on the sodium channel on the nerve fibers. It blocks the sodium entry in to the nerve fiber and thereby inhibits propagation of the nerve impulse. Central nervous system toxicity occurs earlier than the cardiovascular toxicity.

Pharmacokinetics

Bupivacaine is a long acting local anaesthetic related to lidocaine and mepivacaine . But its potency and toxicity is four time greater than the lidocaine .

More lipid soluble in nature , high protein bound. Rapidly absorbed from the site of injection .Peak plasma concentration reaches 5- 30 minutes after the injection. Its duration of action ranges from 360 minutes to 720 minutes. It crosses blood brain barrier and placental barrier .Its mainly bund to acid glycoprotein . In a concentration of 0.5 % bupivacaine , duration of action is from 2 to 5 hrs following a epidural injection and following a peripheral nerve block its action may extend up to 12 hrs. Duration of action is shorter when used in lower concentration[29]

The plasma concentration of bupivacaine is mainly depends on the route of administration , dose and vascularity of injection site . Intercostal blocks attains the highest concentration due to rapid absorption .

It is metabolized in liver, dealkylation to pipecoloxylidine, aromatic hydroxylation .

Most of the drug are excreted as metabolites and only 5 % are excreted in unchanged form .

PHYSIO-CHEMICAL PROFILE

- Protein binding - 95 %
- Molecular weight : 288
- Pka – 8.1
- Partition coefficient – 28 (lipid solubility)
- Elimination t1/2 - 210 mins
- Clearance - 8.3 l /min

PREPARATION

- O.25 %, 0. 5% solution are prepared in 10 , 20 ml vial respectively.
- For subarachnoid injection , 0.5 % of bupivacaine (5mg /ml) mixed with 80 mg of dextrose to increase the baricity (Baricity – 1.0207)

DOSAGE

2 – 2.5 mg / kg of bupivacaine and strength is 0.25% to 0.75% with or without adrenaline . It causes prolonged PR interval , QT interval

- Re-entrant tachycardia and ventricular arrhythmias can occur
- Results from high lipid solubility of the drug
- R- enantiomer is more toxic than S- enantiomer
- Pregnancy causes more toxic effects of bupivacaine

ALLERGIC REACTION

It occurs due to presence of preservative methyl paraben.

USES

- Local infiltration and ring block
- Peripheral nerve block
- Central neuroaxial blocks

CONTRAINDICATION

- Known hypersensitivity to local anaesthetic of amide group
- Regional infection / septicaemia
- Intravenous regional anaesthesia

REVIEW OF LITERATURE

1) Nathalie Dieudonne et al[24] Anesthesia and Analgesia 2001;92:1538-1542 Performed the BSCPB at the end of thyroid surgery to studied the analgesic efficacy of the block . Two groups were randomly assigned to receive the block using normal saline (group A) , Bupivacaine 0.25% with adrenaline 1 in 2 L (Group B) . Results showed group B require less morphine post operatively . It was concluded that BSCPB provides significant analgesia intra operative as well post operatively, and reduces the opioid requirement post operatively.

2.) Sophie Aunac et al 2002;95:746-750: performed both superficial and deep cervical plexus block in patient undergoing thyroid surgery. Three groups were randomly allotted to receive the block using normal saline (group A) , Ropivacaine (Group B), and Ropivacaine with clonidine (Group C) . The Results showed Intra operative requirement were lower in group B, C than Group A. Post operative analgesic were also significantly reduced in Group B, Group C than Group A.

3) Zeynep Eti et al[35] 2006;102 :1174-6 They studied the analgesic efficacy of local wound infiltration and Bilateral Superficial Cervical Plexus in patient undergoing thyroid surgery. Total of 45 patients were divided in to 3 group. Group 1 received local infiltration with

bupivacaine , group 2 received BSCPB using bupivacaine 0.25 % and third group , no block was performed. Main outcome measured was Postoperative analgesic requirement , VAS score . Group 1 requires more analgesia than other two group. VAS Score and Analgesic requirement were similar between group 2 and group 3. It was concluded that there was no significant differences between the local infiltration and BSCPB group with respect to VAS score and Analgesic requirement.

4) G. Andrieu , H . Amrouni , E. Robin[2] Br J Anaesth 2007;99:561-566 studied the Analgesic efficacy of bilateral superficial cervical plexus block done under general anesthesia before thyroid surgery. Three groups consist of 30 patients were given bilateral superficial cervical plexus block using normal saline , Ropivacaine and Ropivacaine , clonidine mixture. They studied the analgesic efficacy and intra operative and post operat ive opioid requirement . It has been found that patient who received the normal saline requires opioid and other analgesia in the form acetaminophen higher than the patient who received Ropivacaine and Ropivacaine , clonidine mixture . It was concluded that Bilateral superficial cervical plexus block using ropivacaine and clonidine improved intra operative and post operative analgesia.

5) De Q. H Tran , Shubada Dugani , and Roderick J . Finlayson[6] 2010;35:539-543 done a prospective , randomized double – blinded study to compare the landmark technique and ultrasound guided technique for bilateral superficial cervical plexus block for patient undergoing thyroid surgery. Total of 40 patients were randomly allocated to receive the block for both landmark technique and ultrasound guided technique . The block was performed before induction of surgery.

The main outcome measured was success of the technique (it is defined as absence of cold sensation for all 4 branches of the superficial cervical plexus at 15 mins. They also recorded onset time , block pain score, performance time and complication rate. The success rate was 80 % in landmark technique group, where as it was 85% in ultrasound guided group. Performance time was slightly higher in ultrasound guided group. But no differences in onset time noted between the 2 group. They concluded that Ultrasound guided technique dose not increases the success rate much, as compared to land mark based technique .

6) Ming – Lang Shih , Quan – Yang Duh[22] 2010;34:2338-2343 studied the analgesic efficacy of bilateral superficial cervical plexus performed in patients undergoing thyroid surgery and also study whether it reduces the adverse effects of general anesthesia . Three groups were randomly allotted to receive the superficial cervical plexus

using normal saline , 0.5% bupivacaine , and levobupivacaine 0.5% . The parameter studied to assess the analgesic efficacy are intra operative anesthetic(desflurane) number of patient requiring post operative analgesia , time of rescue analgesia , VAS score .

7) Issak kesisoglou, M.D , PhD , Theodosis et al 2010;32:984-988 Bilateral superficial cervical plexus block was given to 100 patients undergoing thyroid surgery. Two groups are allotted. Group A received normal saline, while Group B received Ropivacaine . The parameters studied were Pain score, and analgesic requirement. Pain sore was noted 0 ,3 , 6 , 9 , 12, and 24 hrs after surgery. Results showed Analgesic requirement was similar between the two groups. But Pain score was significantly lower in group B . It was concluded that BSCPB reduces pain score post operatively with no significant differences in analgesic requirement.

8) Gurkan Y , Tas Z , Toker K Solak M[14] 2015;29:579-584: In this study the ultrasound guided bilateral superficial cervical plexus block reduces the postoperative opioid consumption following thyroid surgery.

Fifty patient were included in this single blinded study. In this study, Bilateral superficial cervical plexus was performed under ultrasound guidance using 10 ml of 0.25% of bupivacaine.

Post operatively patient was provided with patient controlled analgesia using morphine. They have found that post operative morphine consumption was lower in patient who received block than control group.

It was concluded that ultrasound guided bilateral superficial cervical plexus block performed before thyroid surgery reduces the opioid requirement postoperatively.

Results showed end tidal desflurane concentration were lower in patient who received bupivacaine group compared to normal saline group. It takes longer time for rescue analgesia post operatively for patient received bupivacaine than normal saline. VAS score were lower in group who received bupivacaine.

It is concluded that Bilateral Superficial Cervical Plexus performed during thyroid surgery reduces the anesthetic requirement . It also reduces the analgesic requirement post operatively and shorten the hospital stay.

SAMPLE SIZE CALCULATION

Sample size was determined based on

Study

A Randomized Comparision Between Ultrasound-Guided And Landmark=Based Superficial Cervical Plexus Block

Authored by

De Q.H. Tran et al

Published in

Reg. Anaesth Pain Med 2010:35, 539-543

In this study the performance time was slightly longer with US(119 versus 61 sec: $p<0.001$) with a difference of 51%.

Description

The confidence level is estimated at 95%

with a z value of 1.96

the confidence interval or margin of error is estimated at +/-13

Assuming that 80 percent of the sample will have the specified attribute

p% =51 and q%=49

$n = p\% \times q\% \times [z/e\%]^2$

$n= 51 \times 49 \times [1.96/13]^2$

n= 56.81

Therefore 57 is the minimum sample size required for the study.

In our study 60 subjects were chosen (n=30 in Landmark Group and n=30 in US Group)

MATERIALS AND METHODS

This Prospective , randomized , double blinded study compared landmark technique and ultrasound guided technique for Bilateral Superficial Cervical Plexus in patient undergoing thyroid surgeries.

Total of 60 patients were allocated , 30 patients to receive landmark technique , another 30 patient to receive ultrasound guided technique.

This study was done at Rajiv Gandhi Government General Hospital , Chennai from june 2015 to august 2015in elective operation theatre.

This study was approved by institutional ethical committee , informed consent from all patient was obtained .

SELECTION OF CASES

Inclusion Criteria

- Age : 20 years and above
- Weight : BMI < 30kg/m2
- ASA : I ,II,&III
- Mallampatti: I &II
- Euthyroid state

Exclusion Criteria

- Patient refusal
- Not satisfying inclusion criteria
- Patients posted for emergency surgery
- Patients with difficult airway
- Lack of written informed consent
- Pregnant female
- H/O of seizure and any other neurological deficits
- Poor lung compliance and pulmonary fibrosis
- Coagulation disorders
- Patients with retro sternal goitre

Pre operative assessment was done . All the investigation verified. Total of 60 patients were randomly assigned into two group by closed envelope method. Group A to receive Superficial Cervical Plexus Block by landmark based technique , Group B to receive SCPB by ultrasound guided technique. 10 ml of 0.25 % bupivacaine was used as a local anaesthetic on each side.

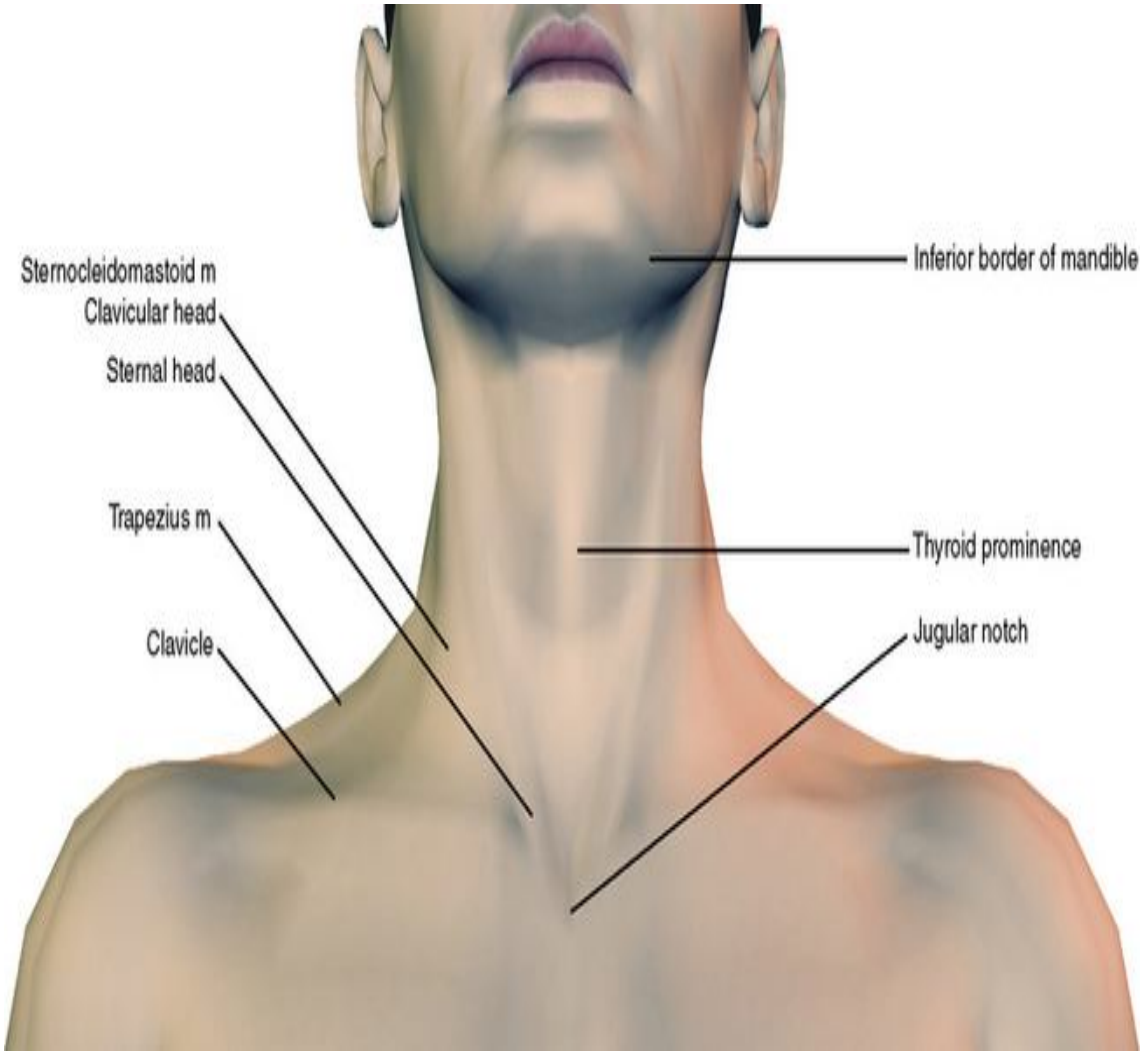
All patients were given BSCPB by landmark technique and USG Guided technique before induction of General anaesthesia .

Monitors used are NIBP, ECG SPO2 , and ETCO2. IV line secured in left hand with 18 g venflon.

All Patients were premedicated with inj glycopyrolate 10 ug/kg i.m. The injection containing local anesthetic was given to Anesthesiologist who is performing the procedure . The specific injections used for block was not known to the patient , surgeon , and Anesthesiologist and doctor involved in the assessment of pain score at PACU.

Bilateral Superficial cervical plexus block was performed in both the technique , landmark and USG guided by an Anesthetist who was familiar in this technique before induction of anesthesia.

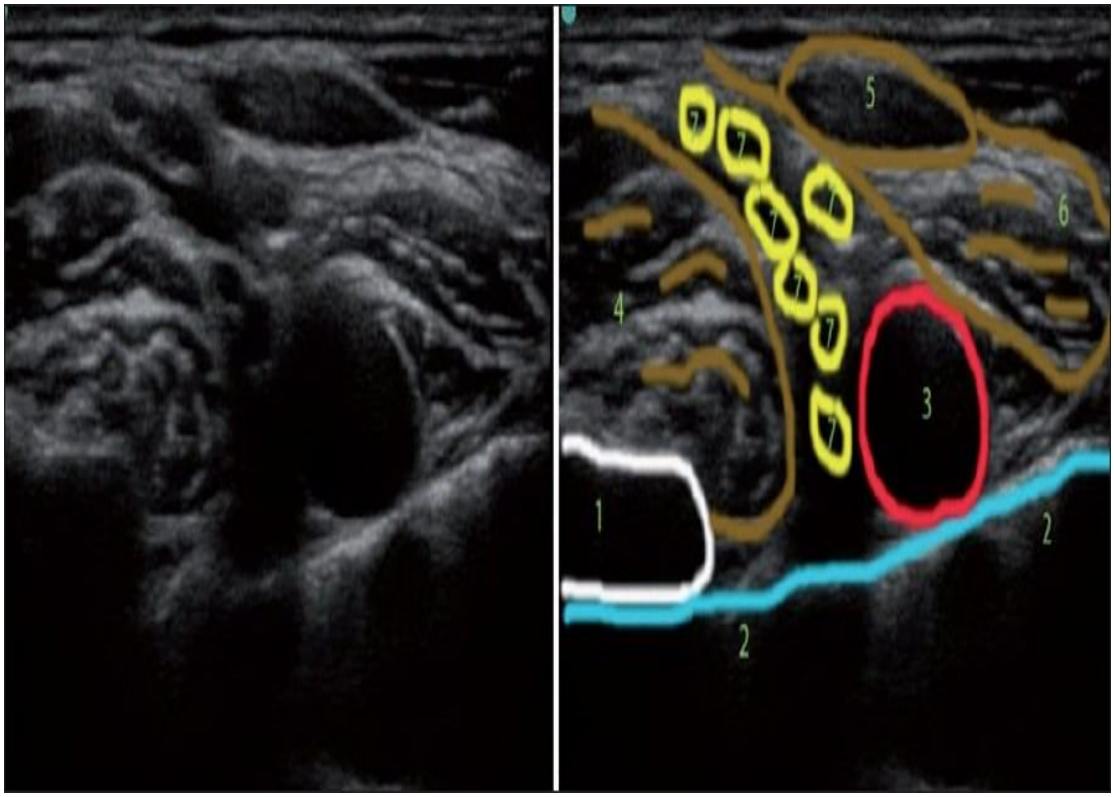
Landmark Technique:



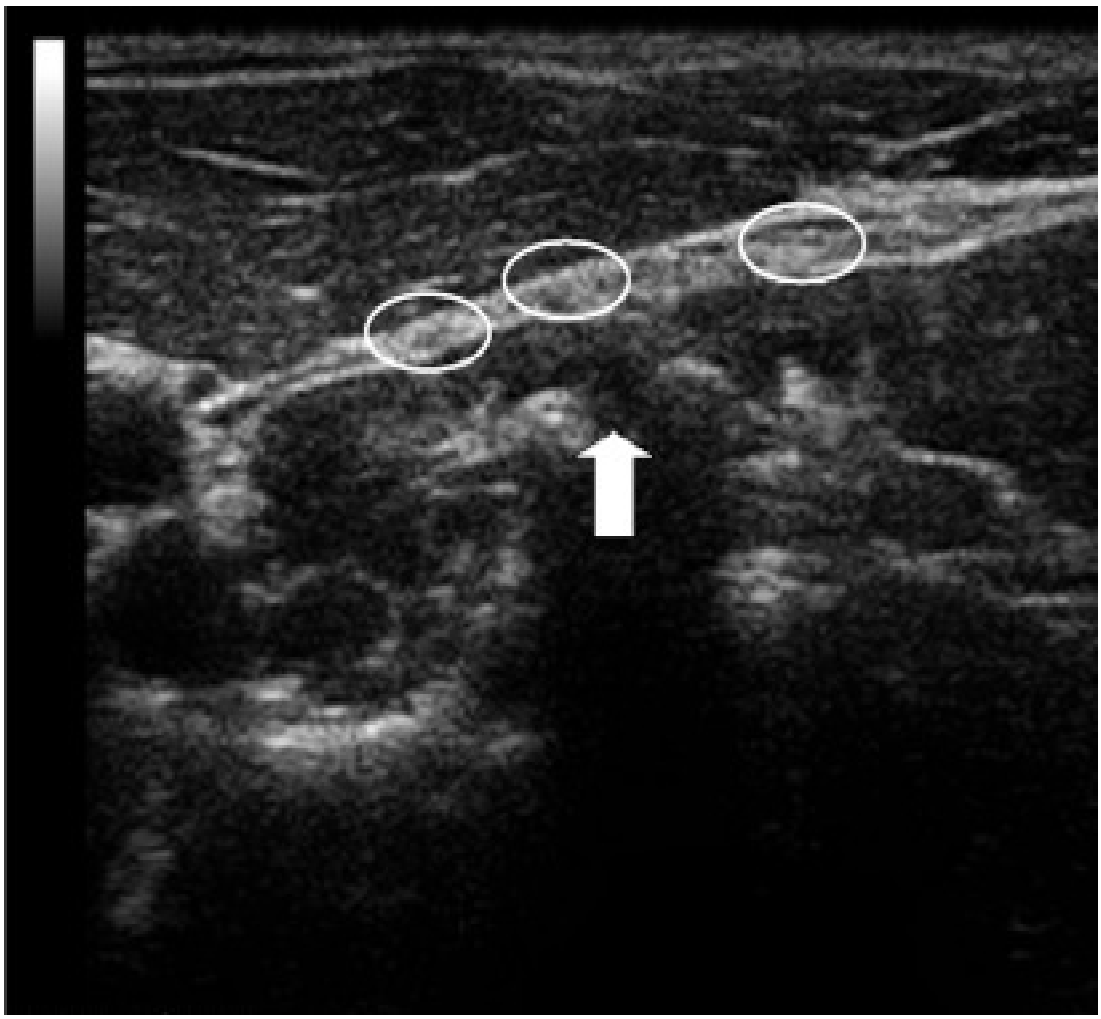
Patient was positioned in the supine , with head turned slightly toward the non operative side. Under full strict aseptic precaution, needle puncture site was identified as mid portion of the posterior border of the sternocleidomastoid muscle .

25 G block needle inserted at midpoint of the posterior border of the sterno mastoid muscle as described, 2 – 3 ml of 0. 25 % bupivacaine local anesthetic is injected. And then needle is directed upwards towards the mastoid process 4 – 5 ml of local anaesthetic given while withdrawing the needle. Now the needle is being directed towards down to clavicle, 4- 5 ml of local anesthetic is being administered while withdrawing the needle. The same procedure was performed inn opposite side as well[6].

USG GUIDED TECHNIQUE



In this technique, patient was positioned in lateral side with the operative side upper most. Using Ultrasound , high frequency linear probe(10 – 12 HZ) , mid portion of the sterno mastoid muscle was scanned in a coronal section to identify the inter muscular plane between the sterno mastoid muscle and scalenus muscles. Using a in plane technique 25 G needle was inserted in the inter muscular plane, 10 ml of 0.25 % bupivacaine is injected[33].



PARAMETERS OBSERVED

1) Success of technique : It is defined as absence of cold sensation for all 4 branches of superficial cervical plexus at 15 mins.

2) Onset time: Time taken for absence of cold sensation after completion of the procedure.

3) Performance time :

   a. Landmark technique- The time interval between the needle puncture and end of local anaesthetic injection.

   b. USG Guided - The time interval between the contact of USG probe with the acquisition of sono anatomical picture and end of local anesthetic injection.

4) Block pain score – using VAS score

5) Intra operative Haemodynamics- like HR,NIBP and ,MAP were recorded every 5 mins..

6) Post operative Pain Score

7) Complication

After 3 mins of 100 % pre oxygenation , patient in supine position, Induction was done with Inj Fentanyl 2 ug / kg , Inj Thiopentone sodium 5 mg / kg . After confirming the possibility of mask ventilation , Inj Atracurium 0.5 mg / kg was given. Then Under direct

laryngoscopy , Patient intubated orally with cuffed flexo metallic endotracheal tube of appropriate size. Position confirmed by 5 point auscultation and ETCO2 tracing . Anesthesia was maintained with N2 : O 2 2 : 1 ratio , Sevoflurane .Intra operative hamodynamics like HR, NIBP , MAP were recorded.

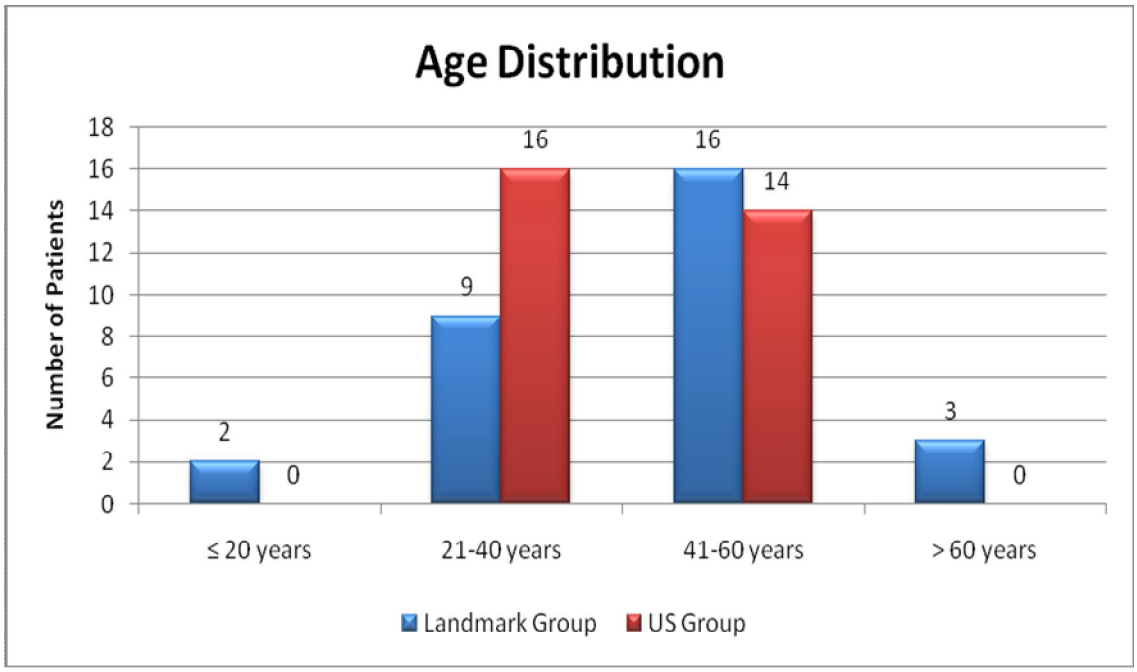
At the end of surgery, Patient was reversed with 50 ug / kg of neostigmine with 10 ug /kg of glycopyrolate I.V. Thorough oral suctioning was done . Patient extubated after adequate neuromuscular recovery.

Patient was shifted to PACU for observation. Pain score was assessed using VAS score for every 5 mins . For patient with VAS score > 4 , rescue analgesia in the form of I.V Acetaminophan 10mg/kg i.v administered. Patient was observed for complication related to procedure and recorded.

DATA ANALYSIS

Descriptive statistics was done for all data and were reported in terms of mean values and percentages. Suitable statistical tests of comparison were done. Continuous variables were analysed with the unpaired t test.. Categorical variables were analysed with the Chi-Square Test and Fisher Exact Test. Statistical significance was taken as $P < 0.05$. The data was analysed using SPSS version 16 and Microsoft Excel 2007.

AGE

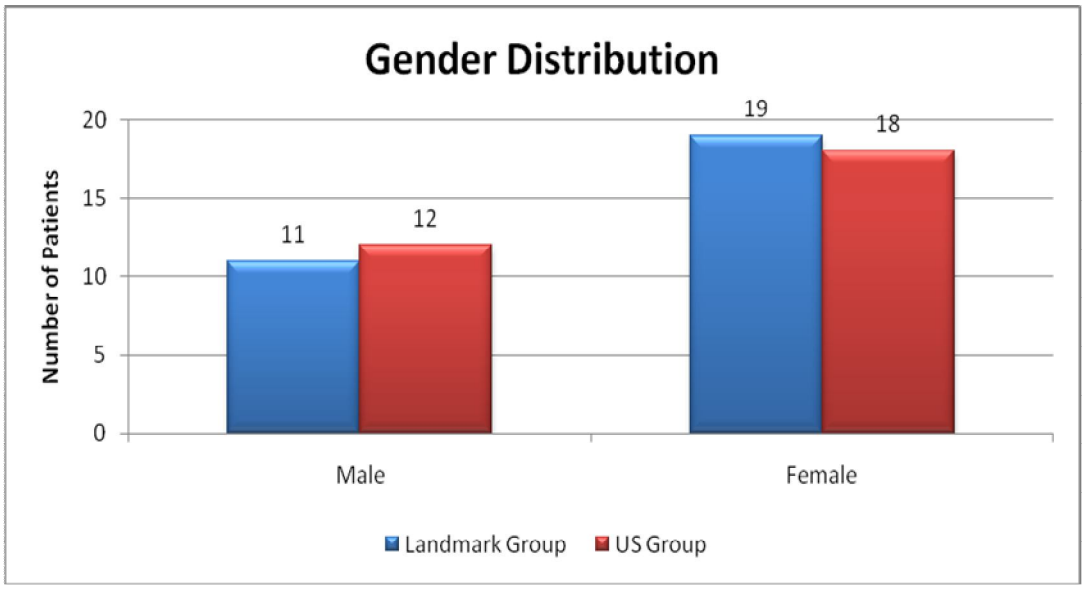


Age Distribution	Landmark Group	Percentage	Ultrasound Group	Percentage
≤ 20 years	2	6.67	0	0.00
21-40 years	9	30.00	16	53.33
41-60 years	16	53.33	14	46.67
> 60 years	3	10.00	0	0.00
Total	30	100	30	100

Age Distribution	Landmark Group	Ultrasound Group
N	30	30
Mean	46.17	41.47
SD	13.34	8.32
P value Unpaired t Test		0.1081

Majority of the Landmark Group patients belonged to the 21-60 years age class interval (n=16, 53.33%) with a mean age of 46.17 years. In the Ultrasound Group patients, majority belonged to the 21-40 years age class interval (n=16, 53.33%) with a mean age of 41.47 years. The association between the intervention groups and age distribution is considered to be not statistically significant since $p > 0.05$ as per unpaired t test.

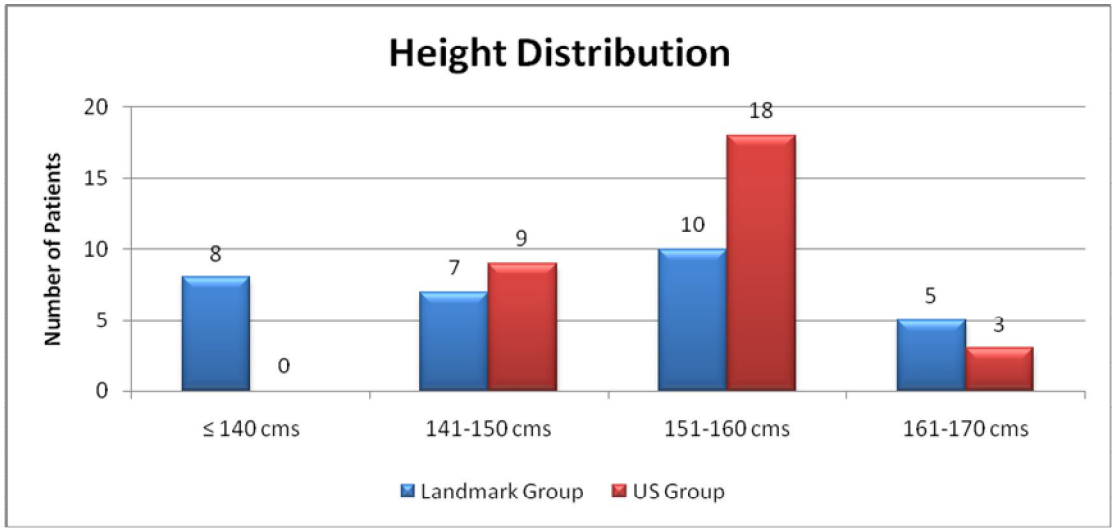
GENDER



Gender Distribution	Landmark Group	Percentage	Ultrasound Group	Percentage
Male	11	36.67	12	40.00
Female	19	63.33	18	60.00
Total	30	100	30	100
P value Chi Squared Test			0.7906	

Majority of the Landmark Group patients belonged to the female gender class interval (n=19, 63.33%). In the Ultrasound Group patients, majority belonged to the same gender class interval (n=18, 60%). The association between the intervention groups and gender distribution is considered to be not statistically significant since $p > 0.05$ as per chi squared test.

HEIGHT



Height Distribution	Landmark Group	Percentage	Ultrasound Group	Percentage
≤ 140 cms	8	26.67	0	0.00
141-150 cms	7	23.33	9	30.00
151-160 cms	10	33.33	18	60.00
161-170 cms	5	16.67	3	10.00
Total	30	100	30	100

Height Distribution	Landmark Group	Ultrasound Group
N	30	30
Mean	152.60	154.67
SD	10.62	5.11
P value Unpaired t Test		0.233

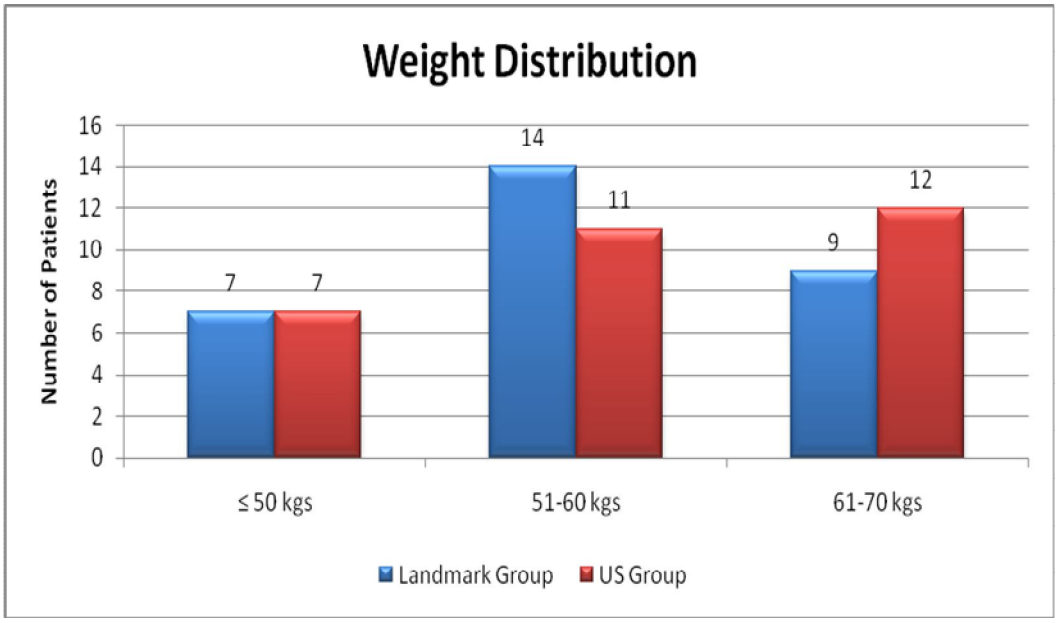
RESULTS

In patients belonging to Landmark Group, the mean height measurement 152.60 cms. In Ultrasound Group, the mean height measurement is 154.67 cms. The decreased mean height measurement in Landmark Group compared to the ULTRASOUND Group is statistically not significant as the p value is 0.233 as per unpaired t- test.

DISCUSSION

The mean height measurement was meaningfully less in Landmark Group compared to the Ultrasound Group by 2.07 cms. The association between the intervention groups and height distribution is considered to be not statistically significant since $p > 0.05$ as per unpaired t test.

Weight

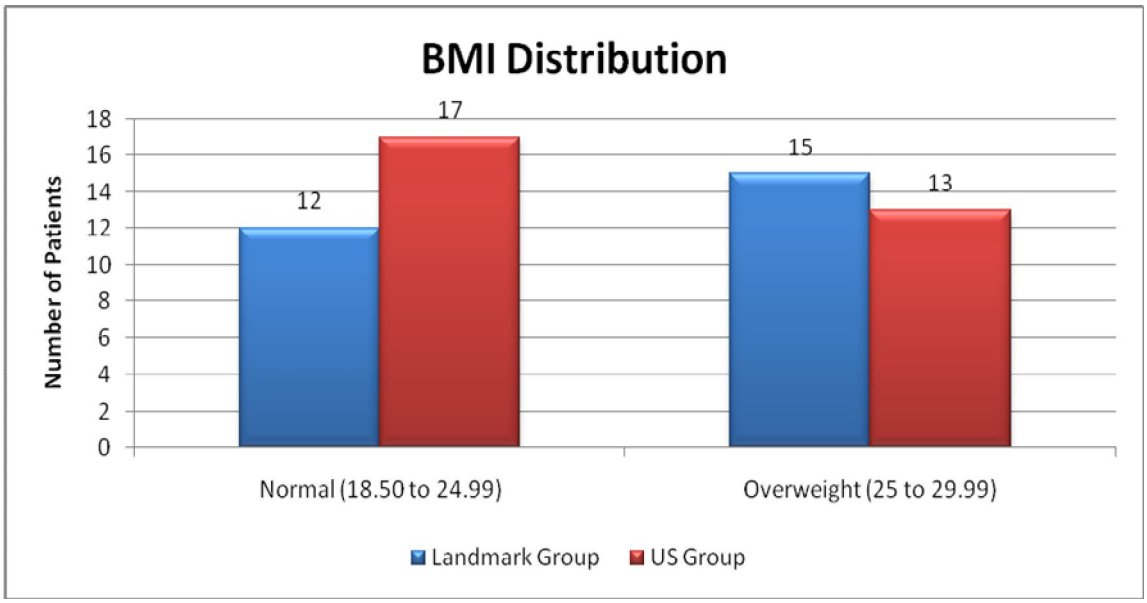


Weight Distribution	Landmark Group	Percentage	Ultrasound Group	Percentage
≤ 50 kgs	7	23.33	7	23.33
51-60 kgs	14	46.67	11	36.67
61-70 kgs	9	30.00	12	40.00
> 70 kgs	0	0.00	0	0.00
Total	30	100	30	100

Weight Distribution	Landmark Group	Ultrasound Group
N	30	30
Mean	56.73	57.97
SD	7.71	7.43
P value Unpaired t Test		0.5307

Majority of the Landmark Group patients belonged to the 51-60 kgs weight class interval (n=14, 46.67%) with a mean weight of 56.73 kgs. In the Ultrasound Group patients, majority belonged to the 61-70 kgs weight class interval (n=12, 40%) with a mean weight of 57.97 kgs. The association between the intervention groups and weight distribution is considered to be not statistically significant since $p > 0.05$ as per unpaired t test.

BMI

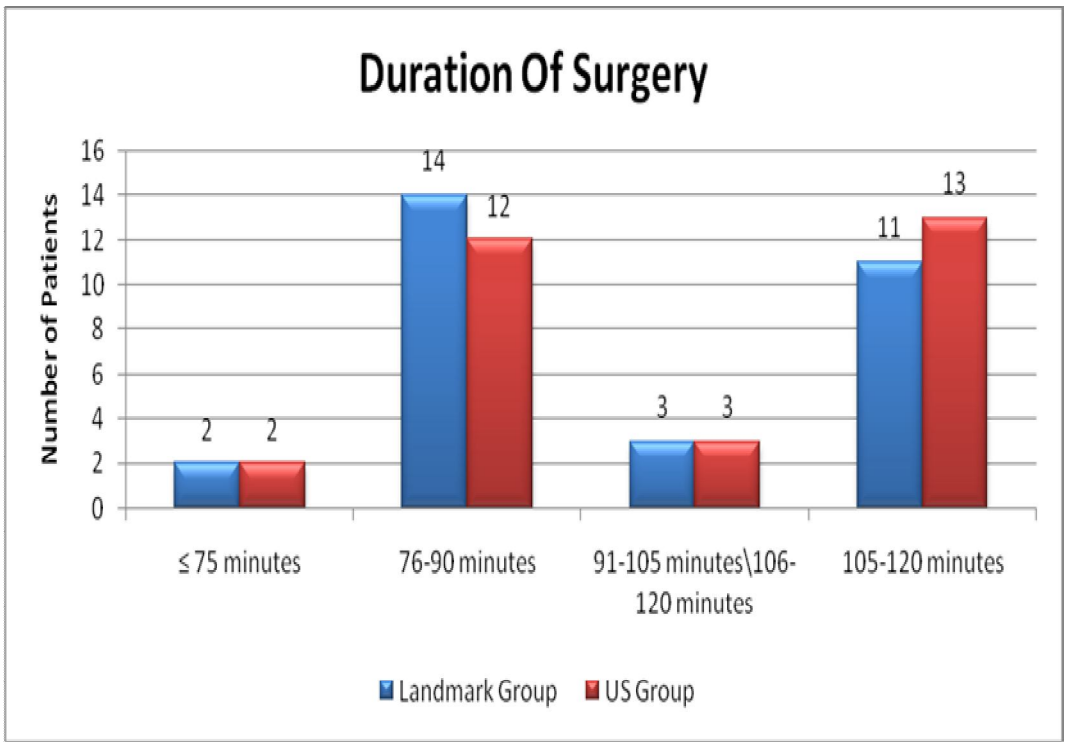


BMI Distribution	Landmark Group	Percentage	Ultrasound Group	Percentage
Underweight (≤ 18.49)	0	0.00	0	0.00
Normal (18.50 to 24.99)	15	50.00	17	56.67
Overweight (25 to 29.99)	15	50.00	13	43.33
Obese	0	10.00	0	0.00
Total	30	100	30	100

BMI Distribution	Landmark Group	Ultrasound Group
N	30	30
Mean	24.63	24.10
SD	2.78	1.83
p value Unpaired t Test		0.0675

Majority of the Landmark Group patients belonged to the overweight BMI class interval (n=15, 50%) with a mean BMI of 24.63. In the Ultrasound Group patients, majority belonged to the normal BMI class interval (n=17, 56.67%) with a mean BMI of 24.10. The association between the intervention groups and BMI distribution is considered to be not statistically significant since $p > 0.05$ as per unpaired t test.

DURATION OF SURGERY

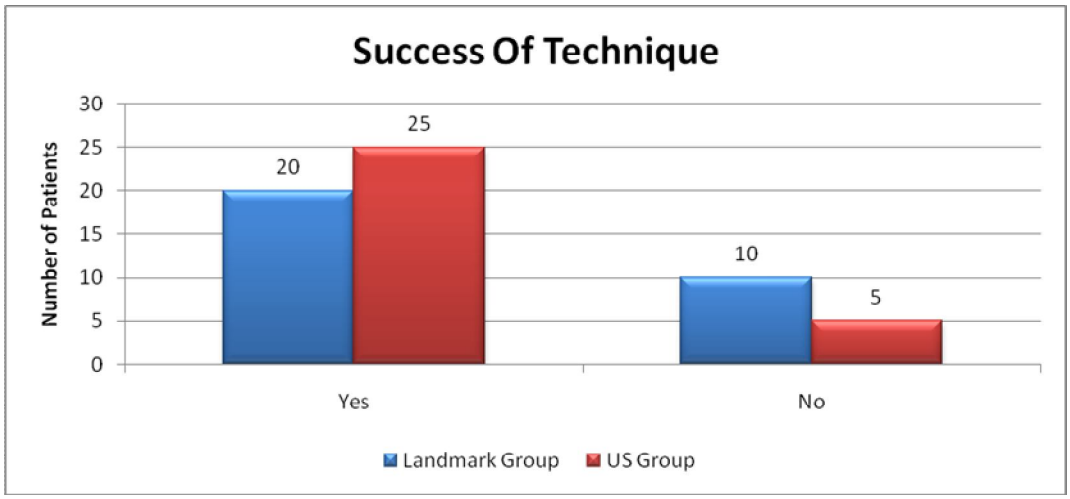


Duration Of Surgery	Landmark Group	Percentage	Ultrasound Group	Percentage
≤ 75 minutes	2	6.67	2	6.67
76-90 minutes	14	46.67	12	40.00
91-105 minutes\106-120 minutes	3	10.00	3	10.00
105-120 minutes	11	36.67	13	43.33
Total	30	100	30	100

Duration Of Surgery	Landmark Group	Ultrasound Group
N	30	30
Mean	96.83	97.50
SD	15.51	16.54
p value Unpaired t Test		0.8726

Majority of the Landmark Group patients belonged to the 76-90 minutes duration of surgery class interval (n=14, 46.67%) with a mean duration of surgery of 96.83 minutes. In the Ultrasound 40%) with a mean duration of surgery of 97.50 minutes. The association between the intervention groups and duration of surgery distribution is considered to be not statistically significant since the p value is < 0.05.

SUCCESS OF TECHNIQUE



Success Of Technique	Landmark Group	Percentage	Ultrasound Group	Percentage
Yes	20	66.67	25	83.33
No	10	33.33	5	16.67
Total	30	100	30	100
p value Chi Squared Test			0.0460	

Majority of the Landmark Group patients belonged to the successful technique class interval (n=20, 66.67%). In the Ultrasound Group patients, majority belonged to the successful technique class interval (n=25, 80.33%). The association between the intervention groups and success of technique is considered to be statistically significant since $p < 0.05$ as per chi squared test

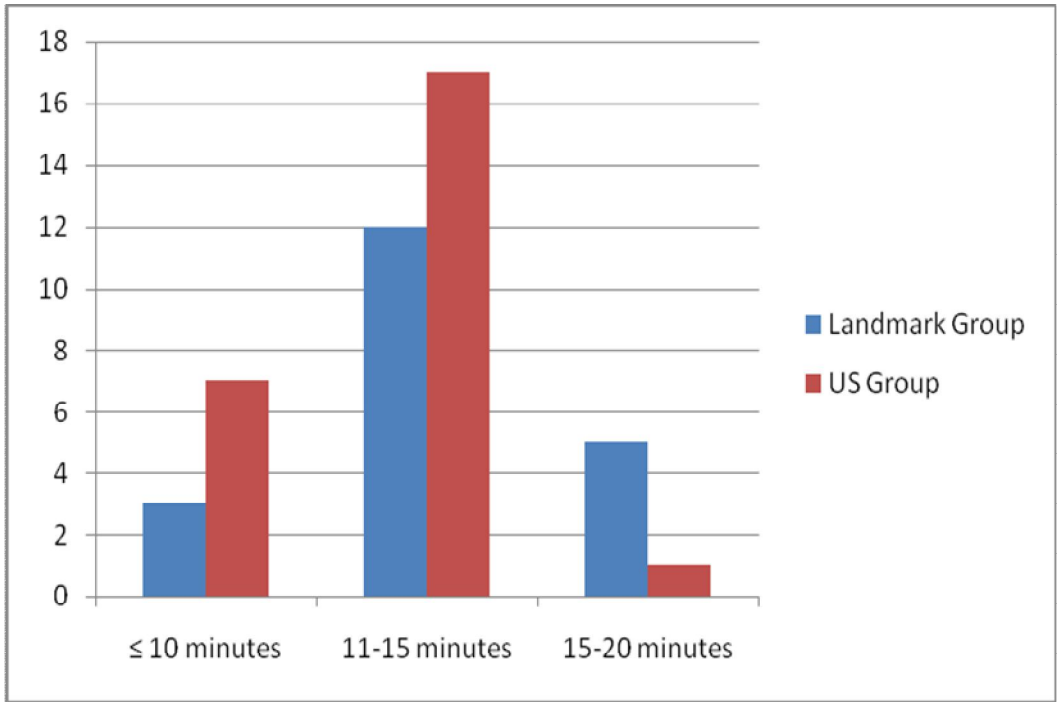
DISCUSSION

The mean success rate was meaningfully less in Landmark Group compared to the Ultrasound Group. This significant difference of 20% decrease in success rate in Landmark Group compared to the Ultrasound Group is true and has not occurred by chance.

CONCLUSION

In this study we can safely conclude that success rate was significantly and consistently higher in Ultrasound guided Group compared to the landmark technique group preoperatively.

ONSET TIME



ONSET TIME

Onset Time	Landmark Group	Percentage	Ultrasound Group	Percentage
≤ 10 minutes	3	15.00	7	28.00
11-15 minutes	12	60.00	17	68.00
15-20 minutes	5	25.00	1	4.00
Total	20	100	25	100

Onset Time	Landmark Group	Ultrasound Group
N	20	25
Mean	16.20	11.12
SD	2.20	1.15
p value Unpaired t Test		0.0013

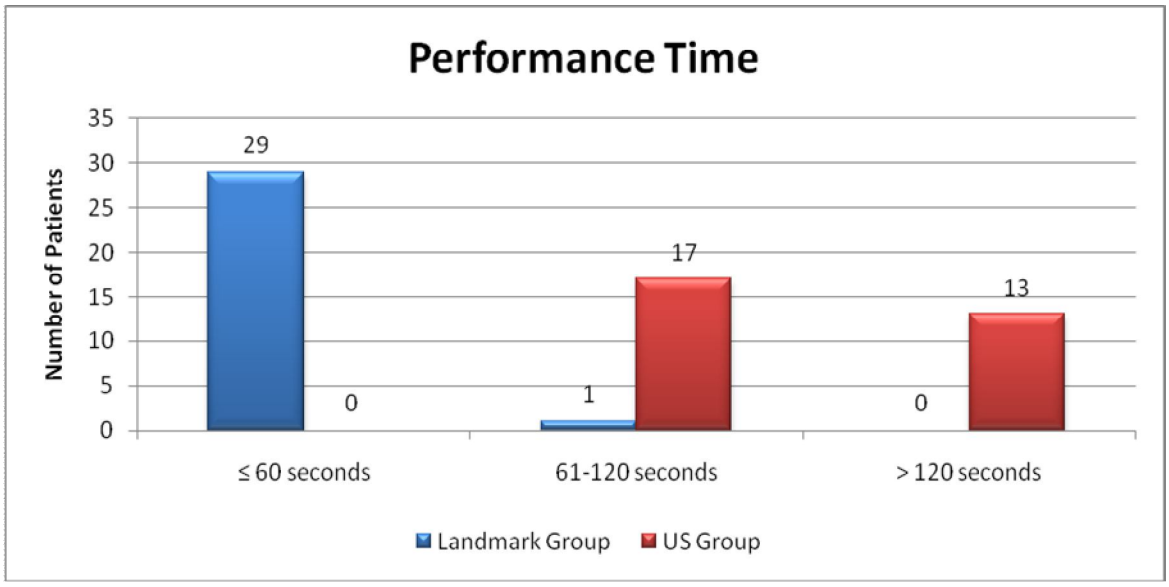
RESULTS

In patients belonging to Landmark Group, the mean onset time measurement is 16.20 minutes. In Ultrasound Group, the mean onset time measurement is 11.12 minutes. The decreased mean onset time measurement in Ultrasound Group compared to the Landmark Group is statistically significant as the p value is 0.0013 as per unpaired t- test indicating a true difference among study groups.

CONCLUSION

In this study we can safely conclude that mean onset time measurement was significantly and consistently more in Landmark Group compared to the ultrasound Group preoperatively.

PERFORMANCE TIME



Performance Time	Landmark Group	Percentage	Ultrasound Group	Percentage
≤ 60 seconds	29	96.67	0	0.00
61-120 seconds	1	3.33	17	56.67
>120 seconds	0	0.00	13	43.33
151-200 seconds	0	0.00	0	0.00
Total	30	100	30	100

Performance Time	Landmark Group	Ultrasound Group
N	30	30
Mean	45.73	119.83
SD	9.44	16.21
p value Unpaired t Test		0.0001

RESULTS

In patients belonging to Landmark Group, the mean performance time measurement is 45.73 seconds. In Ultrasound Group, the mean performance time measurement is 119.83 seconds. The decreased mean performance time measurement in Landmark Group compared to the Ultrasound Group is statistically significant as the p value is 0.0001 as per unpaired t- test indicating a true difference among study groups.

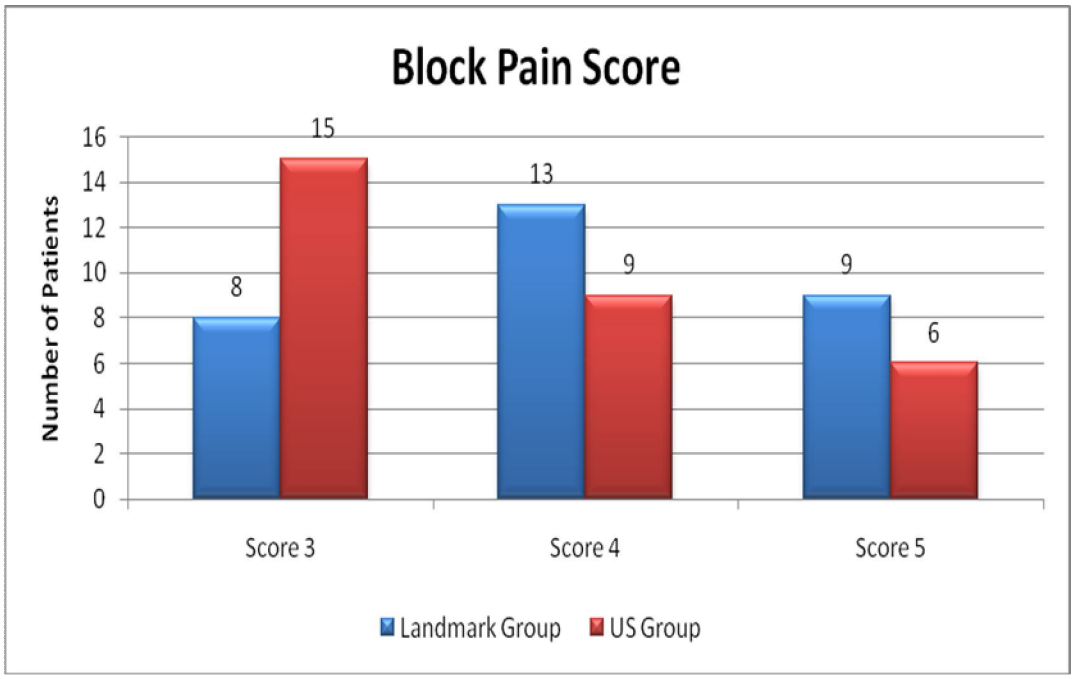
DISCUSSION

The mean performance time measurement was meaningfully less in Landmark Group compared to the Ultrasound Group by 1.92 minutes. This significant difference of 14% decrease in mean performance time measurement in Landmark Group compared to the Ultrasound Group is true and has not occurred by chance.

CONCLUSION

In this study we can safely conclude that mean performance time measurement was significantly and consistently lower in Landmark Group compared to the Ultrasound Group preoperatively.

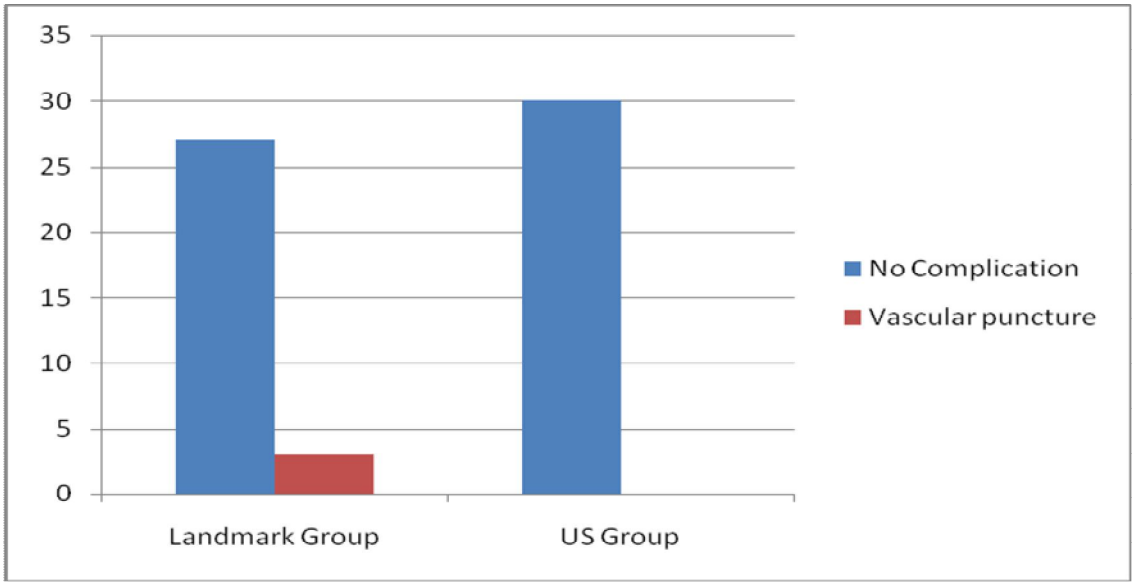
BLOCK PAIN SCORE



Block Pain Score	Landmark Group	Percentage	Ultrasound Group	Percentage
Score 3	8	26.67	15	50.00
Score 4	13	43.33	9	30.00
Score 5	9	30.00	6	20.00
Total	30	100	30	100
P value Chi Squared Test			0.1777	

Majority of the Landmark Group patients belonged to the block pain score 4 class interval (n=13, 65%). In the ULTRASOUND Group patients, majority belonged to the block pain score 3 class interval (n=15, 60%). The association between the intervention groups and block pain scoring is considered to be not statistically significant since p > 0.05 as per chi squared test

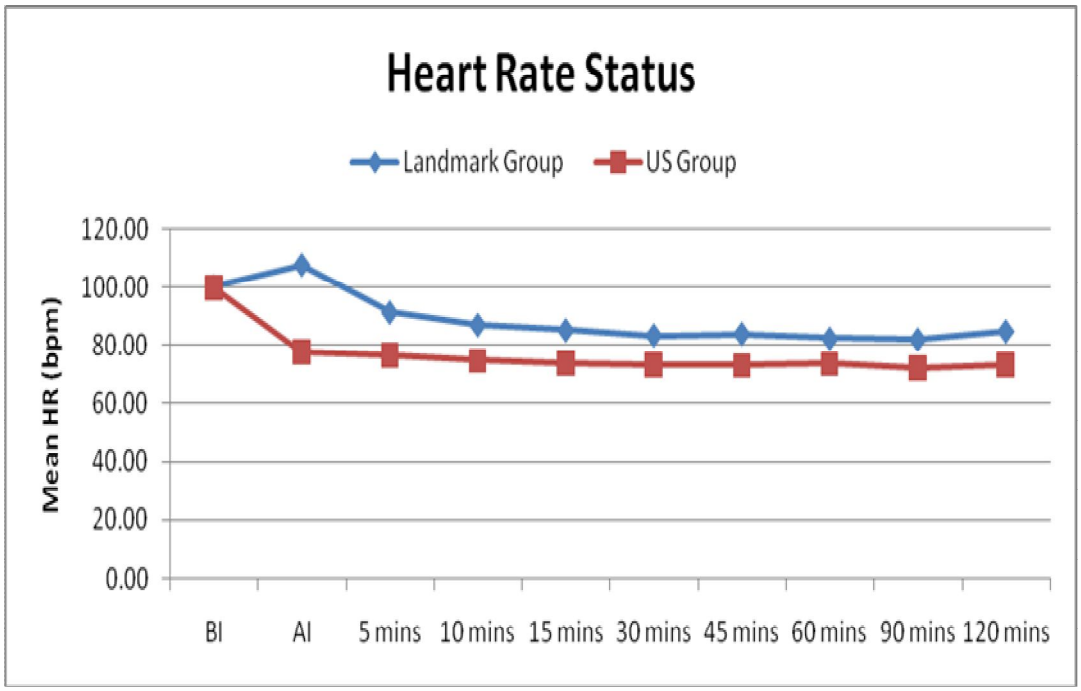
COMPLICATIONS



Complications	Landmark Group	Percentage	Ultrasound Group	Percentage
No Complication	27	90.00	30	100.00
Vascular puncture	3	10.00	0	0.00
Total	30	100	30	100
p value Chi Squared Test			0.9999	

In Landmark technique group, 3 out of 30 patient had vascular puncture where as none had vascular puncture in Ultrasound technique group. The association between the intervention groups and complications is considered to be not statistically significant since $p > 0.05$ as per chi squared test.

HEART RATE



Heart Rate Status		BI	AI	5 mins	10 mins	15 mins
Landmark Group	N	30	30	30	30	30
	Mean	100.37	107.67	91.37	87.07	85.23
	SD	13.43	12.60	14.21	13.05	14.04
Ultrasound Group	N	30	30	30	30	30
	Mean	100.07	77.80	76.87	75.03	74.30
	SD	11.81	8.66	10.01	8.50	8.07
P value Unpaired t Test		0.9271	0.0000	0.0000	0.0001	0.0006

Heart Rate Status		30 mins	45 mins	60 mins	90 mins	120 mins
Landmark Group	N	30	30	30	27	23
	Mean	83.50	84.03	82.40	82.11	84.91
	SD	15.27	15.57	15.76	14.71	14.18
ULTRASOUND Group	N	30	30	30	30	28
	Mean	73.57	73.30	73.83	72.40	73.50
	SD	8.62	8.85	9.89	8.60	9.80
P value Unpaired t Test		0.0033	0.0020	0.0150	0.0046	0.0023

RESULTS

By conventional criteria the association between the intervention groups and heart rate is onsidered to be statistically significant since $p < 0.05$ as per unpaired t test. In simple terms, in patients belonging to landmark group, the mean HR is increased to an average of 123.93 88.87 bpm in comparison with patients belonging Ultrasound group in whom the mean HR is an average of 77.07 bpm

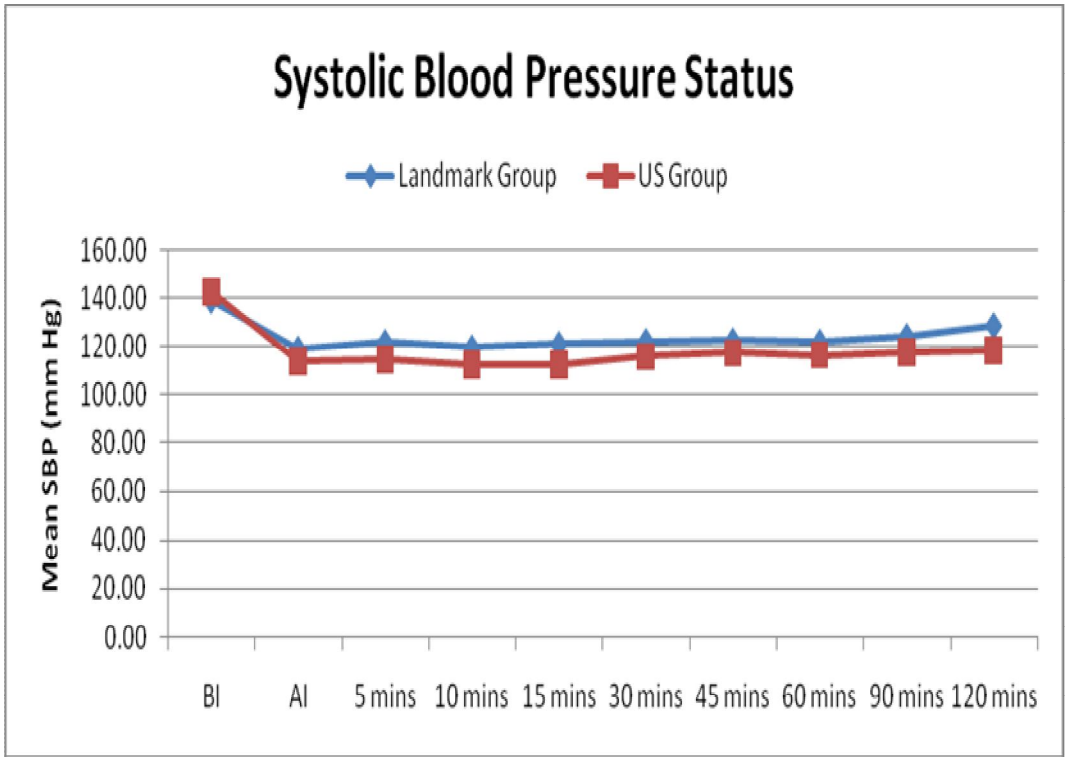
DISCUSSION

The mean HR was meaningfully more in landmark group compared to ULTRASOUND group by a mean difference of 11.80 bpm. This significant difference of 1.15 times increase in mean HR in landmark group compared to ULTRASOUND group is true and has not occurred by chance. This indicates that there is a true difference among intervention groups and the difference is significant with a p-value of 0.0000 according to unpaired t-test.

CONCLUSION

In this study we can safely conclude that landmark group results in significantly increased mean HR compared to ULTRASOUND group.

SYSTOLIC BLOOD PRESSURE



Systolic Blood Pressure StatUltrasound		BI	AI	5 mins	10 mins	15 mins
Landmark Group	N	30	30	30	30	30
	Mean	139.10	119.00	121.70	119.47	120.90
	SD	17.03	15.83	17.89	16.47	17.65
ULTRASOUND Group	N	30	30	30	30	30
	Mean	142.93	114.30	115.03	112.83	112.73
	SD	10.03	8.69	7.36	9.43	9.51
P value Unpaired t Test		0.2935	0.1609	0.0666	0.0618	0.0308

Systolic Blood Pressure Status		30 mins	45 mins	60 mins	90 mins	120 mins
Landmark Group	N	30	30	30	27	23
	Mean	122.13	122.37	121.83	124.22	128.61
	SD	14.74	11.87	11.23	12.97	14.45
ULTRASOUND Group	N	30	30	30	30	28
	Mean	116.13	117.63	116.77	117.77	118.68
	SD	8.59	8.86	8.97	9.10	10.97
P value Unpaired t Test		0.0601	0.0857	0.0587	0.0366	0.0097

RESULTS

By conventional criteria the association between the intervention groups and systolic blood pressure is considered to be statistically significant at 15, 90 and 120 minutes since $p < 0.05$ as per unpaired t test. In simple terms, in patients belonging to landmark group, the mean SBP is increased to an average of 123.93 mm Hg in comparison with patients belonging ULTRASOUND group in whom the mean SBP is an average of 118.48 mm Hg.

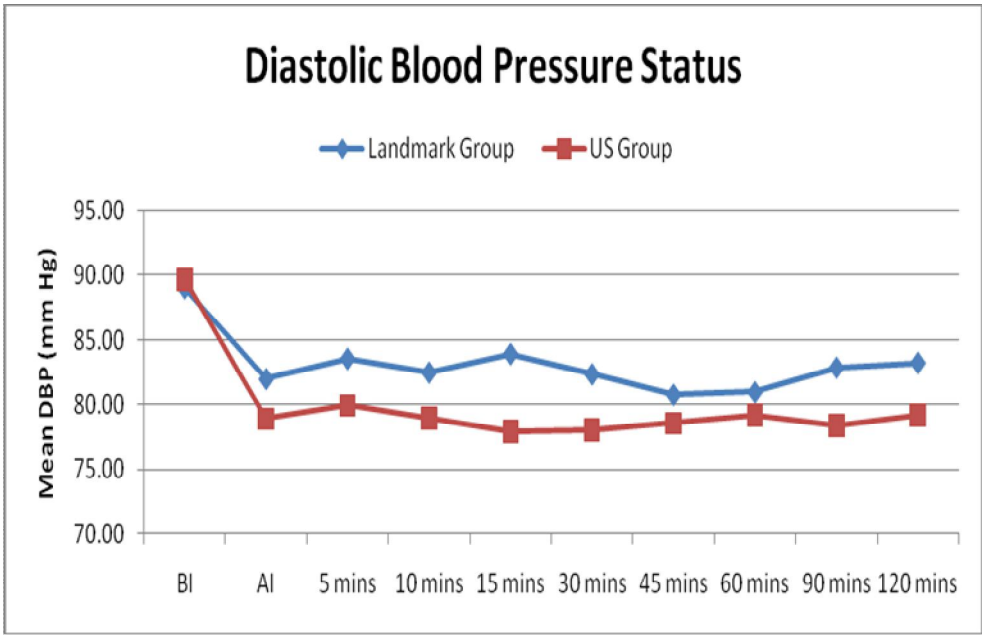
DISCUSSION

The mean SBP was meaningfully more in landmark group compared to ULTRASOUND group by a mean difference of 5.45 mm Hg. This significant difference of 1.05 times increase in mean SBP in landmark group compared to ULTRASOUND group is true and has not occurred by chance. This indicates that there is a true difference among intervention groups and the difference is significant with a p-value of 0.0308, 0.0366 and 0.0097 according to unpaired t-test.

CONCLUSION

In this study we can safely conclude that landmark group results in significantly increased mean SBP compared to ULTRASOUND group

DIASTOLIC BLOOD PRESSURE

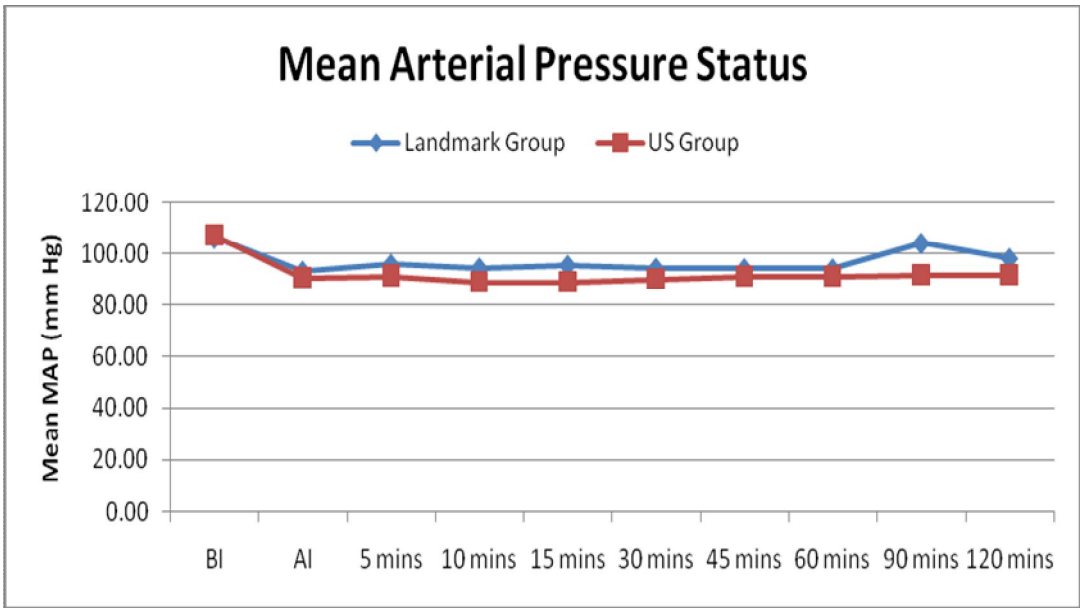


Diastolic Blood Pressure Status		BI	AI	5 mins	10 mins	15 mins
Landmark Group	N	30	30	30	30	30
	Mean	89.00	81.97	83.53	82.47	83.90
	SD	8.73	11.90	14.37	13.40	14.29
ULTRASOUND Group	N	30	30	30	30	30
	Mean	89.70	78.87	79.90	78.90	77.87
	SD	7.97	7.17	7.70	7.79	8.16
p value Unpaired t Test		0.7470	0.2276	0.2286	0.2138	0.0505

Diastolic Blood Pressure Status		30 mins	45 mins	60 mins	90 mins	120 mins
Landmark Group	N	30	30	30	27	23
	Mean	82.33	80.73	80.93	82.85	83.22
	SD	10.35	8.63	8.17	9.72	8.38
Ultrasound Group	N	30	30	30	30	28
	Mean	78.03	78.53	79.13	78.33	79.18
	SD	8.92	8.80	7.07	8.94	7.73
P value Unpaired t Test		0.0901	0.3321	0.3654	0.0744	0.0829

Majority of the Landmark Group patients belonged had a mean diastolic blood pressure of 83.09 mm Hg.. In the ULTRASOUND group patients had a mean DBP of 79.84 mm Hg. The association between the intervention groups and DBP is considered to be not statistically significant since $p > 0.05$ as per unpaired t test

MAP



Mean Arterial Pressure Status		BI	AI	5 mins	10 mins	15 mins
Landmark Group	N	30	30	30	30	30
	Mean	106.37	93.43	96.13	94.67	95.73
	SD	9.90	12.58	15.36	14.47	15.32
ULTRASOUND Group	N	30	30	30	30	30
	Mean	107.33	90.63	91.50	89.10	89.07
	SD	7.99	7.85	8.11	8.62	8.70
P value Unpaired t Test		0.6790	0.3063	0.1511	0.0766	0.0439

Mean Arterial Pressure Status		30 mins	45 mins	60 mins	90 mins	120 mins
Landmark Group	N	30	30	30	28	23
	Mean	94.60	94.40	94.33	104.32	98.39
	SD	12.13	9.82	8.83	59.97	9.81
ULTRASOUND Group	N	30	30	30	30	28
	Mean	90.00	91.30	91.07	91.80	91.86
	SD	9.20	8.77	7.28	7.55	8.37
P value Unpaired t Test		0.1038	0.2023	0.1236	0.2822	0.0152

RESULTS

By conventional criteria the association between the intervention groups and mean arterial pressure is considered to be statistically significant at 15 and 120 minutes since $p < 0.05$ as per unpaired t test. In simple terms, in patients belonging to landmark group, the mean MAP is increased to an average of 97.24 mm Hg in comparison with patients belonging ULTRASOUND group in whom the mean MAP is an average of 92.3 mm Hg.

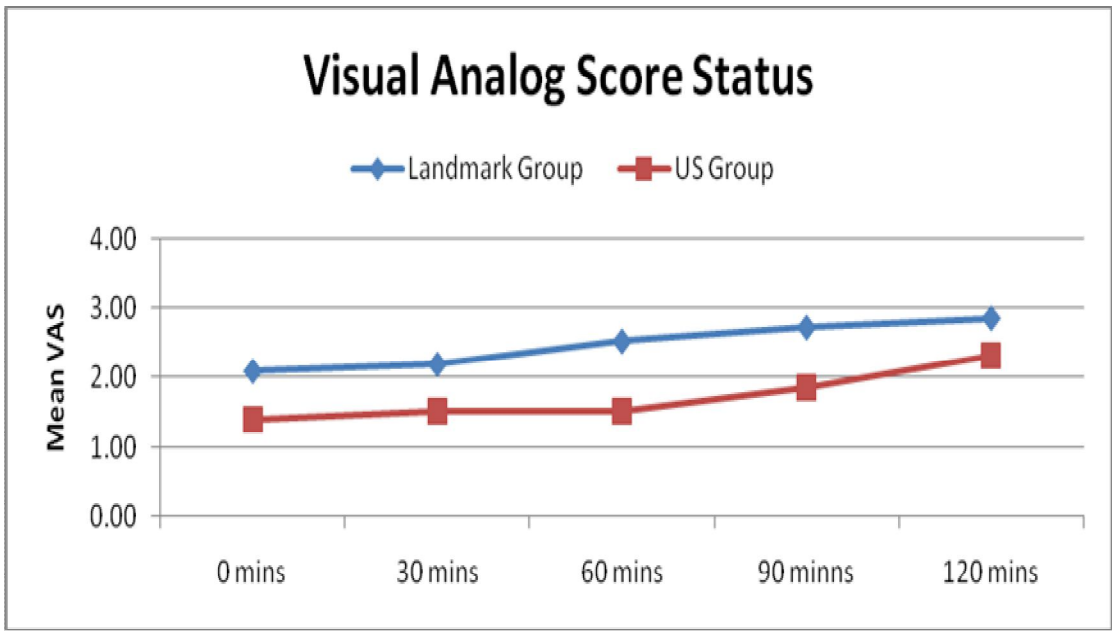
DISCUSSION

The mean MAP was meaningfully more in landmark group compared to ULTRASOUND group by a mean difference of 4.87 mm Hg. This significant difference of 1.05 times increase in mean MAP in landmark group compared to ULTRASOUND group is true and has not occurred by chance. This indicates that there is a true difference among intervention groups and the difference is significant with a p-value of 0.0439 and 0.0152 according to unpaired t-test.

CONCLUSION

In this study we can safely conclude that landmark group results in significantly increased mean MAP compared to ULTRASOUND group.

VAS



Visual Analog Score Status		0 mins	30 mins	60 mins	90 minns	120 mins
Landmark Group	N	30	30	30	30	30
	Mean	2.10	2.20	2.53	2.73	2.87
	SD	0.76	0.71	0.78	1.05	0.97
ULTRASOUND Group	N	30	30	30	30	30
	Mean	1.40	1.53	1.53	1.87	2.33
	SD	0.67	0.73	0.73	0.78	0.48
P value Unpaired t Test		0.0004	0.0007	0.0000	0.0006	0.0101

RESULTS

By conventional criteria the association between the intervention groups and Visual Analog Score is considered to be statistically significant since $p < 0.05$ as per unpaired t test. In simple terms, in patients belonging to landmark group, the mean Visual Analog Score is increased to an average of 2.49 points in comparison with patients belonging ULTRASOUND group in whom the mean Visual Analog Score is an average of 1.73 points.

DISCUSSION

The mean Visual Analog Score was meaningfully more in landmark group compared to Ultrasound group by a mean difference of 0.75 points. This significant difference of 1.43 times increase in mean Visual Analog Score in landmark group compared to Ultrasound group is true and has not occurred by chance. This indicates that there is a true difference among intervention groups and the difference is significant with a p-value of 0.0004, 0.0395, 0.0007, 0.0000, 0.0006 and 0.0101 according to unpaired t-test.

CONCLUSION

In this study we can safely conclude that landmark group results in significantly higher mean Visual Analog Score compared to Ultrasound group

DISCUSSION

The observation and results revealed a clear benefit from ultrasound- guided technique than the land mark guided technique for bilateral superficial cervical plexus block. This is manifested as higher success rate , faster onset time , lesser complication rate. These findings are similar to results previously published studies and meta analysis of randomized controlled studies comparing these two techniques.

DEMOGRAPHIC PROFILE

This present study included the patient posted for total thyroidectomy. The demographic profile of our patients was comparable in both the groups with the respect to age , BMI , ASA Physical status . There is no difference in the duration of surgery among the two groups.

SUCCESS RATE

A study done by De Q .H Tran M.D, Shubhuda Dugani compared the ultrasound – guided and land mark based technique for superficial cervical plexus block. Success of the technique was defined as absence of cold sensation for all four branches of superficial cervical plexus . In their study , Ultrasound – guided approach yields a higher success rate (85%) than land mark technique(80%) . The present study , ultrasound – guided technique yields a higher success rate of 83% , where as land mark technique group attains a success rate of 67%. The difference was found to be statistically significant since the p- value is < 0.05 as per chi squared test .This correlates with the study results done previously.

ONSET TIME

A study done by De Q .H Tran M.D, Shubhuda Dugani compared the onset time between the two groups .i.e ultrasound guided and landmark technique . Onset time was defined as time required to attain the success rate. They have found in their study that there was no significant difference in onset time between the two groups.

In present study, It was found that, the onset time was significantly lower in ultra-sound guided group (11.12 mins) than the land mark technique group (16.20). The difference was found to be statistically significant since the p- value is since $p < 0.05$ as per chi squared test.

PERFORMANCE TIME

A study done by De Q .H Tran M.D, Shubhuda Dugani Performance time was compared between the two groups. In ULTRASOUND Group, performance time was defined as time taken for acquisition of satisfactory ultrasound picture and deposition of local anesthetic solution . In Land mark technique group, it was defined as time taken for needling and deposition of local anesthetic solution. They have found that performance time was significantly higher in ultrasound group than land mark technique group.

In present study, performance time was 119 sec in Ultrasound group and 45 sec in land mark group. This was statistically significant since p- value is < 0.05 as per chi squared test. This is similar to results seen in previous studies.

BLOCK PAIN SCORE

A study done by De Q .H Tran M.D, Shubhuda Dugani Block pain score was recorded Using VAS Score. A Score of 3 to 5 was noted in all patients. There was no significant difference in VAS score between the two groups.

The present study, Majority of patient in both group i. e Land mark technique and ultrasound guide group had a VAS score of 3 to 5. It was found that there was no significant difference in VAS score between the two groups since the p- value is < 0.05 as per chi squared test.

COMPLICATIONS

A study done by De Q .H Tran M.D, Shubhuda Dugani ,no incidence of vascular puncture, horner syndrome ,and local anesthetic toxicity noted. One patient in ULTRASOUND group developed hoarseness of voice and difficulty in swallowing .one patient in land mark group developed brachial palsy.

The present study, incidence of complications were compared between landmark technique and Ultrasound guided technique group. Three cases of vascular puncture were noted in land mark group and none in ultrasound group. No incidence of local anesthetic toxicity , Horner syndrome and unilateral phrenic nerve palsy were noted in any of the group..

HEMODYNAMIC STABILITY

A study done by De Q .H Tran M.D, Shubhuda Dugani compared the intra operative vitals between the two groups. The results showed no significant difference in intra operative hamodynamics. The present study, since Ultrasound guided technique increase the success rate , hemodynamic stability was better in USG Guided group than land mark technique group.

In this study, HR , SBP, DBP, and MAP during intra operative are well controlled in ULTRASOUND Group than the land mark group.

POST OPERATIVE VAS SCORE

The VAS score in ULTRASOUND group is better than land mark technique group. Patients belonging to landmark group, the mean Visual Analog Score is increased to an average of 2.49 points in comparison with patients belonging ULTRASOUND group in whom the mean Visual Analog Score is an average of 1.73 points. This is statistically significant since the p value is < 0.05

SUMMARY

In this study comparing landmark technique and ultrasound – guided technique for superficial cervical plexus block . The following parameters were observed. Success of technique, onset time , Performance time ,Block pain score , Intra operative hamodynamics , post operative VAS score and complication rate

1. Success rate :

Ultrasound- guided Group - 83%

Land mark technique Group – 67 %

There is significant increase in success rate in ultrasound group.

2. Onset time :

Ultrasound –guided Group – 11.12 mins

Land mark technique Group – 16.20 mins

There is significant faster onset time in ULTRASOUND group.

3. Perfromance time :

Ultrasound - guided group - 119.83 sec

Land mark technique group - 45.73 sec

There is significant increase in performance time in Ultrasound group.

4. Block pain score

Ultrasound- guided group - 3 to 4

Land mark technique group- 3 to 5

No significant statistical difference noted between the two groups.

5. Hemodynamic stability : Intra – operative hemodynamic was better in Ultrasound group than Land mark technique group and this was statistically significant.

6. VAS Score : Pain relief was better in ultrasound guided technique than Land mark technique group. VAS score was lower in ultrasound group and this was statistically significant.

5. Complication rate : Three cases of vascular puncture noted in Landmark technique Group. No complication reported in ultrasound guided technique group.

CONCLUSION

Bilateral Superficial Cervical Plexus block performed by Ultrasound guided in this study results in higher success rate , faster onset time , better hemodynamic and this technique is safe and reliable when compared to land mark technique in patients undergoing thyroid surgery.

BIBLIOGRAPHY

1. Aunac S , carlier M , Singelyn F , De kock M : The analgesic efficacy of bilateral combined superficial and deep cervical plexus administered before thyroid surgery under general anesthesia .Anesth Analg 2002; 95:746-50

2. Andrieu G, Amrouni H, Robin E et al . Analgesic efficacy of bilateral superficial cervical plexus block administered before thyroid surgery under general anesthesia . Br J Anaesth 2007 ; 99;561-566

3. B D Chaurasia ‘s HUMAN ANATOMY – Anatomy of Thyroid gland

4. Bailey & love – Principles of General Surgery 11th edition

5. Choi D , Atchabahian A, Brown AR. Cervical plexus block provides postoperative analgesia after clavicle surgery.Anaesthesiology 2005 ;100:1542-1543

6. De Q.H Tran , Shubada Dugani : A Randomized Comparison between Ultrasound –guided and Landmark-based superficial cervical plexus block . Reg Anesth pain med 2010: 539-543

7. Dieudonne N, Gomala A, Prevention of postoperative pain after thyroid surgery : a double – blind randomized study of bilateral superficial cervical plexus block. Anesth Analg. 2001 ;92:1538-1542,

8. Eti Z Irmak P, et al Does bilateral superficial cervical plexus decreases analgesic requirement after thyroid surgery? Anesth Analg 2006; 102: 1174-1176

9. Egan RJ, Hopkins JC, Beamish .Randomized clinical trial of intraoperative superficial cervical plexus block versus incisional local anaesthesia in thyroid and parathyroid surgery.2009-012671-98

10. Ferreira SH, Moncada S, Vane JR. Prostaglandins and the mechanism of analgesia produced by aspirin-like drugs. Br J Pharmacol 1973; 49: 86-97

11. Ganong physiology Thyroid hormone 7th edition

12. Grays Anatomy 11th edition Anatomy of Thyroid Gland

13. Gozal Y , Shapira SC, Gozal D, Magora F. Bupivacaine wound infiltration in thyroid surgery reduces post operative pain and opioid demand . Acta Anaesthesiology Scand 1994; 38:813-5

14. Gurkan Y , Tas Z , Toker K , Solak M. Ultrasound guided bilateral cervical plexus block reduces postoperative opioid consumption following thyroid surgery.2015 oct (5): 579-584

15. Herbland A , Cantini O , Reynier P , et al . The bilateral superficial cervical plexus block with 0.75% ropivacaine administered before or after surgery does not prevent postoperative pain after total thyroidectomy.Reg Anesth Pain Med 2006; 31:34-9

16. Herb , Eti Z , Irmak P , Gulluoglu BM, et al . Does bilateral superficial cervical plexus block decreases analgesic requirement after thyroid surgery Anesth Analg 2006; 102: 1174-6

17. Iand A, Cantini O , Reynier P, et al. The bilateral superficial cervical plexus block with 0.75% ropivacaine administered before and after surgery does not prevent postoperative pain after thyroidectomy. Reg Anses pain Med 2006; 31:34-9

18. Katzang – pharmacology of Bupivacaine

19. Liu SS, Ngeow J John RS . Evidence basis for Ultrasound – block characteristics: onset, quality, and duration . Reg Anesth Pain med . 2010;35:S26-S35

20. Last ‘s Anatomy . Anatomy of Thyroid Gland 9th edition

21. Masters RD , Castresana EJ, Cstresana MR : Superficial and deep cervical plexus block : technical consideration . AANA J 1995 ; 63:235-43

22. Ming –Lang Shih.Quan Yang Duh. Bilateral Superficial cervical plexus block combined with general anesthesia administered in thyroid operation. World J surg (2010)34;2338-2343

23. Millers Anesthesia – 8th edition

24. Nathalie Dieudonne , Alexandra Gomola , Philippe Bonnichon . prevention of post operative pain after thyroid surgery: A Double-blind Randomized Study of Bilateral Supeficial Cervical Plexus Block. Anesthesia and Analgesia June 2001 vol.92 no.6 1538-1542

25. Pintaric S, Hocever M , Jereb s . A prospective Randomized comparison between combined (deep and superficial) and superficial cervical plexus block with levobupivacaine for minimally invasive parathyroidectomy.AnaesthAnalg 2007:105:1160-1163

26. Pandit JJ , Bree S, Dillon P .A comparison of superficial versus combined (superficial and deep) cervical plexus block for carotid endartrectomy: a prospective randomized study. Anesth Analg 2000;91:781-786

27. Pain : Current Understanding of Assessment , Management and Treatment . JCAHO.

28. Post thyroidectomy wound infiltration for post operative pain relief . Hadri, B.; Emini, L.; Arifaj, I.; Krasniqi, I. 2014 ; 31: 229

29. Robert K. Stoelting, Simon C .Hiller , Pharmacology and physiology in Anaesthetic Practice

30. Schug SA, Manopas A. Update on the role of non-opioids for postoperative pain treatment. Best Pract Res Clin Anaesthesiol 2007; 21: 15- 30..

31. Saxe A W , Brown E, Hamburger S. thyroid surgery performed under regional anesthesia. Surgery 1988; 103 :415-20

32. Sonner JM, Hynson JM , Clark O Katz JA .Nausea and vomiting following thyroid and parathyroid surgery. J Clin Anesth 1997 ; 9: 398-402

33. Ultrasound Guided combined intermediate and deep cervical plexus block for regional anasethsia in oral and maxillofacial surgery.2013 Feb ; 42 (2) : 29945724

34. Ultrasound Guided Nerve blocks. Leonard V Bunting M D

35. Zeynep Eti et al 2006;102 :1174-6 Comparison between local infiltration and bilateral superficial cervical plexus block in thyroid surgery.

PROFORMA

NAME:

DATE:

AGE: SEX: IP NO:

DIAGNOSIS:

SURGICAL PROCEDURE DONE:

Ht: cms CVS: RS:

Wt: kgs BT: CT:

Hb: g% Platelets:

PRE OP ASSESSMENT:

HISTORY: Any Co-morbid illness

H/O bleeding diathesis

H/o allergy to local anaesthetics

H/O previous surgeries

PRE OP: HR- /MIN BP- / mmHg

MEAN- mmHg sPo2- %

MEASURES OF STUDY OUTCOME:

Success of the technique – Yes/ No

Onset time - mins

Performance time - sec

Block pain score –

Intra operative haemodynamics:

	HR	SBP	DBP	MAP	RR	Spo2	VAS SCORE
PRE OP							
INTRA OP (AT THE TIME OF BLOCK)							
1 MIN							
5 MIN							
10 MIN							
15 MIN							
30 MIN							
1 HR							
2 HR							
4 HR							
5 HR							
6 HR							
8 HR							
10 HR							
12 HR							
24 HR							

COMPLICATION

RESCUE ANALGESICS USED

INFORMATION TO PARTICIPENTS

Investigator : Dr PRAKASH V

Name of the Participant:

Title : A Prospective, randomized study comparing ultrasound-guided and landmark based technique for superficial cervical plexus block in patient undergoing thyroid surgeries.

You are invited to take part in this research study. We have got approval from the IEC. Your are asked to participate because you satisfy the eligibility criteria. We want to compare and study the safety and efficacy of ultrasound-guided and landmark based superficial cervical plexus block in patient undergoing thyroid surgery

What is the Purpose of the Research:

For Thyroid surgeries, superficial cervical plexus block performed using ultrasound and landmark based technique to study

- To assess the success rate and onset time
- Performance time and number of needle passes
- Intra operative opioid requirement
- Post operative visual analogue scale pain score
- To assess complication rate

The Study Design:

All the patients in the study will be divided into two groups.

Group1- pre operative superficial cervical plexus block using landmark based technique

Group 2- pre operative superficial cervical plexus block using ultrasound technique

All patients will be given general anaesthesia

Benefits

Superficial cervical plexus block improves intra operative hemodynamic, reduces opioid requirement, causes post operative pain relief.

Discomforts and risks

Intravascular local anaesthetic injection

Damage to neuro vascular structure

Seizures can occur – since the drug will be given based on calculated maximum allowable dose this complication does not occur.

This intervention has been shown to be well tolerated as shown by previous studies. And if you do not want to participate you will have alternative of setting the standard treatment and your safety is our prime concern.

Time :
Date :
Place :

Signature / Thumb Impression of Patient
Patient Name:

Signature of the Investigator : _____

Name of the Investigator : _____

PATIENT CONSENT FORM

Study title : "A Prospective, randomized study comparing ultrasound-guided and landmark based technique for superficial cervical plexus block in patient undergoing thyroid surgery.

Study center: INSTITUTE OF ANAESTHESIOLOGY AND CRITICAL CARE,
RAJIV GANDHI GOVT. GENERAL HOSPITAL,
MADRAS MEDICAL COLLEGE,
CHENNAI-0 3.

Participant name: Age: Sex: I.P.No:

I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask the question and all my questions and doubts have been answered to my satisfaction.

I have been explained about the pitfall in the procedure. I have been explained about the safety, advantage and disadvantage of the technique.

I understand that my participation in the study is voluntary and that I am free to withdraw at anytime without giving any reason.

I understand that investigator, regulatory authorities and the ethics committee will not need my permission to look at my health records both in respect to current study and any further research that may be conducted in relation to it, even if I withdraw from the study. I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from the study.

Time:

Date: Signature / thumb impression of patient

Place: Patient name:

Signature of the investigator:

Name of the investigator:

ஆராய்ச்சி தகவல் தாள்

ஆராய்ச்சி தலைப்பு

தைராய்டு சுரப்பி அறுவை சிகிச்சைக்கு முழு மயக்கம் கொடுப்பதற்கு முன்பு மேலோட்டமான கழுத்து நரம்பு பின்னல் பகுதியில் புபிவெகெயின் எனும் மரத்துப்போகும் மருந்து கலவை செலுத்துவதை நுண்ணொலி பயன்படுத்தி அல்லது உடற்கூறு அடிப்படையில் ஒப்பிடுதல்

ஆராய்ச்சியாளர் பெயர் : மருத்துவர்.வெ.பிரகாஷ்

பங்கேற்பாளர் பெயர் :

ஆராய்ச்சியின் நோக்கம்

தைராய்டு சுரப்பி அறுவை சிகிச்சைக்கு முழு மயக்கம் கொடுப்பதற்கு முன்பு மேலோட்டமான கழுத்து நரம்பு பின்னல் பகுதியில் புபிவெகெயின் எனும் மரத்துப்போகும் மருந்து கலவை செலுத்துவதை நுண்ணொலி பயன்படுத்தி அல்லது உடற்கூறு அடிப்படையில் ஒப்பிடுதல்.

1) வெற்றி விகிதம் மற்றும் உணர்ச்சியற்றல் ஆரம்பித்தல் நேரம்

2) செயல்திறன் நேரம் மற்றும் ஊசி செலுத்துவதன் எண்ணிக்கை

3) அறுவை சிகிச்சையின்போது இதர வலி நிவாரணிகளின் தேவை

4) பக்க விளைவுகள்

ஆய்வு முறை

ஆய்வில் பங்குபெறும் நோயாளிகள் இரண்டு குழுக்களாகப் பிரிக்கப்படுவர்.

குழு-1 நுண்ணொலி மூலம் மேலோட்டமான கழுத்து நரம்பு பின்னல் பகுதியில் மரத்துப்போகும் மருந்து கலவை செலுத்துதல்

குழு-2 உடற்கூறு அடிப்படையில் மேலோட்டமான கழுத்து நரம்பு பின்னல் பகுதியில் மரத்துப்போகும் மருந்து கலவை செலுத்துதல்

நன்மைகள்

1) அறுவை சிகிச்சையின்போது நாடித்துடிப்பு மற்றும் இரத்த அழுத்தம் சீராக செயல்பட உதவுகின்றன.

2) இதர வலி நிவாரணிகளின் தேவை வெகுவாக குறைக்கப்படுகின்றன.

3) அறுவை சிகிச்சைக்குப் பின்னர் வலி நிவாரணத்தின் தன்மை நீட்டிக்கப்படுகின்றது.

பக்கவிளைவுகள்

ஊசி போடும்போது அசௌகரியம் ஏற்படலாம். மரத்துப்போகும் ஊசியின் மூலம் இது தவிர்க்கப்படும். குறைந்த இரத்த அழுத்தம், குறைந்த நாடித்துடிப்பு ஏற்படலாம். அதற்கு மாற்று மருந்துகள் உடனடியாக கொடுக்கப்படும்.

இந்த முறையான ஆய்வு ஏற்கனவே பல இடங்களில் நடத்தப்பட்டுள்ளது. மேலும் இதன் பாதுகாப்பு உறுதிசெய்யப்பட்டுள்ளது. நீங்கள் இந்த ஆய்வில் பங்குகொள்ள விரும்பவில்லை என்றால் எப்போதும் உபயோகிக்கப்படும் மருந்தே கொடுக்கப்படும். உங்கள் பாதுகாப்பே எங்களின் முக்கிய நோக்கம்.

இந்த ஆய்வு சம்பந்தமான எல்லா புள்ளி விவரங்கள் மற்றும் நோயாளிகளின் விவரங்கள் ரகசியமாக வைக்கப்படும். இந்த ஆய்வு சம்பந்தப்பட்ட எல்லா பரிசோதனைகள், மருந்துகள் மற்றும் மருத்துவ சேவைகள் அனைத்தும் நோயாளிகளுக்கு இலவசமாக வழங்கப்படும்.

ஆய்வாளரின் பெயர் பங்குபெறுபவரின் பெயர்

ஆய்வாளரின் கையொப்பம் பங்குபெறுபவரின் கையொப்பம்

ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராயச்சியின் தலைப்பு

தைராய்டு சுரப்பி அறுவை சிகிச்சைக்கு முழு மயக்கம் கொடுப்பதற்கு முன்பு மேலோட்டமான கழுத்து நரம்பு பின்னல் பகுதியில் புபிவெகெயின் எனும் மரத்துப்போகும் மருந்து கலவை செலுத்துவதை நுண்ணொலி பயன்படுத்தி அல்லது உடற்கூறு அடிப்படையில் ஒப்பிடுதல்

ஆய்வு நிலையம் : மயக்கவியல் துறை, சென்னை மருத்துவக் கல்லூரி சென்னை - 3.

பங்கு பெறுவரின் பெயர் :

பங்குபெறுபவரின் எண் :

பங்குபெறுபவர் இதனை (✓) குறிக்கவும்

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது. ☐

நான் இவ்வாய்வில் தன்னிச்சையாகதான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன். ☐

இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன். ☐

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக்கொள்ளவும் அதை பிரசுரிக்கவும் என் முழு மனதுடன் சம்மதிக்கின்றேன். ☐

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்து கொள்வதுடன் 'இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிகிறேன். ☐

பங்கேற்பவரின் கையொப்பம் ..... இடம்..... தேதி.....

கட்டைவிரல் ரேகை

பங்கேற்பவரின் பெயர் மற்றும் விலாசம் .....

ஆய்வாளரின் கையொப்பம் ..... இடம்..... தேதி.....

ஆய்வாளரின் பெயர் .....

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003

EC Reg.No.ECR/270/Inst./TN/2013
Telephone No.044 25305301
Fax: 011 25363970

CERTIFICATE OF APPROVAL

To
Dr.Prakash.V.
Post Graduate in Anaesthesia
Institute of Anaesthesiology and Critical Care
Madras Medical College
Chennai 600 003

Dear Dr.Prakash.V.,

The Institutional Ethics Committee has considered your request and approved your study titled " **A PROSPECTIVE AND RANDOMISED STUDY COMPARING ULTRA SOUND GUIDED AND LANDMARK - BASED TECHNIQUE FOR SUPERFICIAL CERVICAL PLEXUS BLOCK IN PATIENTS UNDERGOING THYROID SURGERY"** NO.29032015.

The following members of Ethics Committee were present in the meeting hold on 03.03.2015 conducted at Madras Medical College, Chennai 3

1. Prof.C.Rajendran, MD	:Chairperson
2. Prof.R.Vimala,MD.,Dean,MMC,Ch-3	: Deputy Chairperson
3. Prof.B.Kalaiselvi,MD.,Vice Principal,MMC,Ch-3	: Member Secretary
4. Prof.R.Nandini,MD.,Inst.of Pharmacology,MMC	: Member
5. Prof.K.Ramadevi, Director ,Inst.of Bio-Chem.MMC	: Member
6. Prof.Saraswathy,MD.,Director,Pathology, MMC	: Member
7. Prof.S.G.Sivachidambaram,MD.,Director I/c Inst.of Internal Medicine,MMC	: Member
8. Thiru S.Rameshkumar, B.Com., MBA.	: Lay Person
9. Thiru S.Govindasamy, BA., BL.,	: Lawyer
10.Tmt.Arnold Saulina, MA., MSW.,	: Social Scientist

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

12/6/15

Member Secretary, Ethics Committee

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003

Sys 2

S.No	Name	Age	Sex	IP No	Ht	Wt	BMI	Diagnosis	Surgery	Duration	Technique	success rate	onset time	Performance time	block realted score	complication
1	govindammal	57	F	76793	135	60	32	MNG	TT	90	1	1	12	40	3	1
2	sengammal	40	F	79338	140	48	24	MNG	TT	110	1	1	14	30	4	1
3	geetha	35	F	74175	135	45	25	MNG	TT	90	1	2		45	3	1
4	Anbalagan	46	M	74593	160	62	24	MNG	TT	120	1	1	12	60	5	1
5	Murugan	67	M	69175	165	68	25	MNG	TT	115	1	2		40	3	1
6	Nirmala	51	F	73558	145	50	24	MNG	TT	80	1	1	11	35	3	2
7	Rajakumari	32	F	64422	130	45	26	MNG	TT	90	1	1	13	30	4	1
8	Jayanthi	25	F	64488	158	50	20	MNG	TT	105	1	1	10	40	3	1
9	Nithya	20	F	71914	155	54	22	SNT	TT	70	1	1	12	55	5	1
10	Devika	15	F	69923	145	44	21	SNT	TT	80	1	2		50	5	2
11	Remesh	45	M	64589	167	68	24	MNG	TT	120	1	1	11	40	4	1
12	Sriniasan	60	M	66714	158	58	23	SNT	TT	110	1	1	13	45	4	1
13	Gopalan	55	M	68189	156	60	25	MNG	TT	80	1	2		35	4	1
14	Sujatha	32	F	62689	155	54	22	MNG	TT	90	1	1	12	58	5	1
15	Latha	38	F	54568	145	52	25	MNG	TT	80	1	2		50	4	1
16	Meenakkshi	52	F	74891	138	58	30	SNT	TT	100	1	1	11	60	5	1
17	Kumarevel	58	M	74886	162	66	25	MNG	TT	90	1	1	12	50	4	1
18	Krishnamoorthy	56	M	54362	158	66	26	MNG	TT	110	1	2		48	4	1
19	Rani	40	F	67115	145	62	29	MNG	TT	90	1	1	10	50	5	2
20	Megala	35	F	78112	152	58	25	SNT	TT	85	1	1	12	50	4	1
21	Kalyani	36	F	82115	142	52	26	MNG	TT	90	1	1	15	60	5	1
22	Saroja	48	F	58188	142	58	29	MNG	TT	120	1	2		45	4	1
23	Kalaivani	46	F	66713	146	54	25	MNG	TT	110	1	1	10	40	3	1
24	govindammal	60	F	74183	136	40	22	MNG	TT	80	1	2		30	3	1
25	Maheswari	58	F	78164	140	55	28	MNG	TT	90	1	2		40	4	1
26	Narayanana	60	M	64183	158	60	24	SNT	TT	70	1	1	14	54	5	1
27	Ganesan	62	M	58543	165	68	25	MNG	TT	100	1	1	13	62	5	1
28	Moorthy	50	M	63015	162	64	24	MNG	TT	110	1	1	15	45	4	1
29	Andal	62	F	64032	138	58	30	MNG	TT	110	1	2		35	3	1
30	Anbarasan	44	M	63083	155	65	27	MNG	TT	120	1	1	12	50	4	1

S,NO	HEART RATE													
	BI	AI	At.5 mins	10	15	30	45	60	90	120	BI	AI	At 5 mins	10
1	96	105	98	93	90	93	95	98	105	100	142	148	148	145
2	95	99	94	93	90	85	90	92	91	93	168	148	150	149
3	120	130	104	101	108	88	84	79	81	83	146	137	141	141
4	85	95	72	77	66	87	78	77	70	69	125	102	101	104
5	86	90	79	70	64	66	62	62	61	67	130	107	109	124
6	108	114	105	101	100	90	85	88	65	93	133	119	116	115
7	120	125	106	95	87	71	88	94			142	108	108	112
8	111	118	121	100	115	141	139	132	104	105	151	121	133	135
9	103	115	96	98	94	94	95	82	90		144	128	134	132
10	83	95	90	97	95	94	90	103	88	90	103	106	101	101
11	85	92	92	85	88	82	64	70			131	139	138	145
12	85	92	78	70	73	59	56	52	50	56	166	148	109	111
13	97	105	74	71	70	70	69	64	76	92	143	109	135	110
14	121	125	129	122	114	91	79	82			150	100	90	100
15	85	90	78	67	75	72	96	72	95		140	121	152	128
16	108	110	98	92	81	73	75	74	80	105	121	136	151	142
17	88	98	91	88	90	84	92	73	86		125	118	117	110
18	106	116	105	95	93	93	98	95	105	100	146	138	132	121
19	110	120	102	103	106	105	110	111	110	109	139	133	134	133
20	84	95	98	85	84	87	88	90	91	93	140	109	142	143
21	105	110	89	93	90	93	82	89	90	75	134	105	102	101
22	110	117	90	90	78	77	73	75	74	78	156	123	118	117
23	103	110	93	70	67	72	74	70	70		103	90	120	88
24	68	80	64	68	63	61	82	70	62	68	104	104	104	106
25	115	119	85	83	81	83	84	85	87	84	160	112	120	121
26	115	120	82	80	81	82	80	82	78	76	160	116	116	116
27	105	114	82	83	80	77	75	73	71	72	145	115	110	112
28	98	103	75	72	73	78	81	82	75	73	148	108	104	103
29	108	112	81	78	76	73	70	71	77	80	153	121	119	118
30	108	116	90	92	85	84	87	85	85	92	125	101	97	101
	.	.	.	.										

HEMODYNAMICS-GROUP A														
SBP						DBP								
15	30	45	60	90	120	BI	AI	At 5 mins	10	15	30	45	60	90
142	146	130	143	136	143	81	85	85	86	84	86	79	83	83
148	140	145	140	134	131	100	95	93	88	95	96	92	93	94
147	134	134	125	124	146	94	98	102	102	102	96	95	93	95
105	108	110	107	105	107	84	70	71	76	72	75	76	75	73
122	130	125	127	123	127	90	77	76	94	88	90	88	92	93
114	128	118	120	133	147	87	88	70	69	69	81	75	80	68
90	126	125	123			84	67	68	74	65	85	84	79	
142	139	139	121	122	136	96	82	100	99	103	75	78	78	81
137	136	135	128	131		111	95	98	97	97	89	90	88	94
101	97	96	124	109	131	69	67	70	73	73	65	75	85	80
148	136	119	130			88	106	110	115	118	98	77	91	
118	123	133	107	150	154	93	93	83	81	85	83	85	74	97
117	121	123	123	127	133	86	78	104	75	93	89	86	83	87
104	111	120	116			90	66	60	60	62	74	80	78	
134	120	126	120	142		98	81	95	92	93	84	82	85	97
143	147	130	130	148	148	98	112	110	107	112	115	102	100	104
118	108	121	109	115		87	87	89	76	87	79	90	80	81
121	120	123	141	108	105	92	91	91	85	85	81	84	88	90
139	143	133	137	143	140	91	84	90	91	91	89	78	76	78
141	111	113	115	132	143	86	74	99	97	98	77	78	79	78
99	101	114	111	122	104	88	79	73	71	72	71	72	72	82
119	131	134	133	125	118	92	77	74	75	77	81	87	88	83
88	88	90	99	99		85	68	70	64	63	68	60	72	80
105	108	128	126	126	125	78	80	81	79	79	82	82	78	78
122	121	121	121	119	119	90	86	83	82	83	83	82	80	76
118	124	119	108	110	115	94	82	80	79	80	82	78	75	75
118	121	122	125	119	118	88	69	72	74	75	75	73	75	75
110	118	118	122	122	118	96	77	70	72	72	78	72	75	72
116	121	123	122	118	122	89	82	81	78	77	76	77	71	78
101	107	104	102	112	128	65	63	58	63	67	67	65	62	65

	MAP										VAS SCORE (POST OP)				
120	BI	AI	At 5 mins	10	15	30	45	60	90	120	0 mins	30 mins	60 mins	90 minns	120 mins
91	101	106	106	106	103	106	96	103	101	108	2	2	2	2	2
90	123	113	112	108	113	111	110	109	107	104	1	1	1	1	2
95	111	111	115	115	116	109	108	104	105	112	3	3	3	4	4
77	97	80	80	85	82	86	83	81	84	87	1	1	2	2	2
92	103	87	88	104	99	103	100	105	103	104	2	3	3	3	4
92	102	98	85	84	84	97	86	93	90	110	1	1	2	2	2
	103	81	81	87	73	77	99	98	10		1	1	1	1	1
85	114	95	111	111	116	96	98	92	395	102	2	2	2	2	2
	122	106	110	109	110	105	105	101	109		1	1	1	1	2
80	80	80	81	82	82	76	82	98	92	97	3	3	3	4	5
	106	115	119	125	131	110	87	104			2	2	4	5	2
95	117	111	92	91	96	96	101	85	114	115	2	2	2	2	4
92	105	88	114	87	94	100	98	96	100	106	3	3	3	4	4
	110	77	70	73	76	86	93	91			3	3	3	3	4
	116	90	114	105	107	94	106	100	111		3	3	3	4	4
100	107	120	127	121	123	129	114	106	117	116	2	3	3	3	3
	106	97	98	87	97	89	100	90	92		3	3	3	3	3
73	110	107	105	97	97	94	97	106	96	84	3	3	3	3	4
81	105	86	105	105	105	103	92	90	100	101	3	3	3	3	3
79	108	86	113	112	110	88	90	91	96	100	2	3	4	5	4
76	103	88	83	81	81	81	85	85	95	85	2	2	2	2	2
78	113	92	89	89	91	98	103	103	97	91	3	2	3	3	3
	98	74	80	70	70	73	74	81	85		2	2	3	3	3
83	87	88	88	88	88	91	97	94	94	97	3	2	2	2	2
72	113	94	95	95	96	96	95	94	90	88	2	2	3	3	3
79	116	93	92	91	93	96	92	86	87	91	2	2	2	2	2
75	107	84	85	87	89	90	89	92	90	89	2	2	2	2	2
73	113	85	81	82	85	91	87	92	89	88	1	2	2	2	2
81	110	95	94	91	90	91	92	88	91	95	2	2	3	3	3
75	85	76	71	72	75	76	73	72	81	93	1	2	3	3	3

S.No	Name	Age	Sex	IP No	Ht	Wt	BMI	Diagnosis	Surgery	Duration	Technique	Success Rate	Onset Time	Performance Time	Block Pain Score	Complication Rate	
31	Siva	34	M	64524	160	63	25	MNG	TT	110	2	1	12	130	5	1	
32	Balakumar	32	M	58482	158	60	24	MNG	TT	100	2	2		140	4	1	
33	Ponnummal	48	F	64631	155	58	24	MNG	TT	90	2	1	12	140	3	1	
34	Nirmala	30	F	63742	149	52	23	MNG	TT	80	2	2		130	4	1	
35	Dhanam	54	F	67581	158	64	26	MNG	TT	120	2	1	15	135	5	1	
36	Rose	46	F	66712	151	48	21	SNT	TT	80	2	1	14	120	3	1	
37	Sangeetha	38	F	67158	149	51	23	MNG	TT	110	2	1	18	110	3	1	
38	Selvi	35	F	58115	150	50	22	MNG	TT	80	2	1	12	140	5	1	
39	Natarajan	48	M	74115	158	64	26	SNT	TT	70	2	2		130	4	1	
40	Sekar	45	M	76110	155	62	26	SNT	TT	60	2	1	13	120	3	1	
41	Kanimozhi	41	F	78124	153	60	26	MNG	TT	110	2	1	14	100	3	1	
42	Sudha	34	F	78174	148	48	22	MNG	TT	120	2	1	14	110	4	2	
43	Ravi	42	M	68115	159	68	27	MNG	TT	115	2	1	17	140	5	1	
44	Thilagam	38	F	67115	157	60	24	MNG	TT	80	2	1	16	110	3	1	
45	Asaithambi	36	M	58881	155	65	27	MNG	TT	90	2	1	11	100	3	1	
46	Vijayakumari	37	F	58687	151	55	24	MNG	TT	100	2	1	10	90	3	1	
47	Nagarathinam	60	F	56467	154	58	24	MNG	TT	80	2	2		140	5	1	
48	Girija	55	F	68482	158	55	22	MNG	TT	90	2	1	11	100	3	1	
49	Manikavel	40	M	74148	162	68	26	MNG	TT	110	2	1	13	130	4	2	
50	Rajagopal	49	M	84154	164	68	25	MNG	TT	120	2	1	17	110	3	1	
51	Munusamy	54	M	74185	160	65	25	MNG	TT	110	2	1	15	120	4	1	
52	Sumathy	30	F	68175	147	45	21	SNT	TT	90	2	1	12	130	4	1	
53	Parvathy	44	F	74165	148	50	23	MNG	TT	110	2	1	13	110	3	1	
54	Kalyani	38	F	51495	151	52	23	MNG	TT	90	2	1	14	100	3	1	
55	Devandran	36	M	51568	160	64	25	SNT	TT	110	2	1	15	110	3	1	
56	Thirumaran	54	M	65754	158	66	26	SNT	TT	130	2	2		150	5	1	
57	Kalaiyanaga	44	M	65852	164	70	26	MNG	TT	100	2	1	17	100	3	1	
58	Malarvizhi	38	F	75828	150	48	21	MNG	TT	80	2	1	16	100	3	1	
59	Kavitha	30	F	72831	148	52	24	MNG	TT	90	2	1	15	120	4	1	
60	Sundari	34	F	76821	150	50	22	MNG	TT	110	2	2	17	130	4	1	

S,NO	HEART RATE														
	BI	AI	At 5 mins	10	15	30	45	60	90	120	BI	AI	At 5 mins	10	15
1	115	90	91	88	82	82	75	68	69	88	150	125	128	125	121
2	118	88	85	83	84	75	77	73	78	90	160	129	123	121	128
3	74	63	58	50	60	58	58	56	66	59	130	109	108	110	100
4	103	79	96	79	77	83	78	86	68	78	136	92	124	92	92
5	86	80	82	80	81	74	66	71	64	88	124	110	114	114	113
6	108	72	70	68	62	78	74	72	76	76	135	116	118	116	118
7	113	88	85	81	80	85	89	92	78	75	164	124	121	119	118
8	85	75	76	78	77	75	75	74	64	64	139	118	117	125	123
9	103	86	83	85	86	90	86	93	85	83	135	125	118	115	112
10	118	95	90	80	76	83	82	88	86	86	145	104	104	107	104
11	98	68	67	70	71	68	65	68	64	60	133	105	108	110	112
12	88	80	78	75	77	71	72	75	80	82	133	121	123	124	118
13	110	87	89	85	88	88	92	87	82	78	148	117	124	114	123
14	93	76	75	78	79	82	84	78	76	71	149	122	123	124	125
15	92	70	67	68	64	64	63	64	60	60	147	123	123	132	130
16	100	85	83	76	72	78	80	84	72	80	150	113	115	96	98
17	95	78	78	76	70	63	66	59	64	68	153	114	120	97	119
18	115	86	88	87	85	83	81	83	85	82	132	108	108	105	104
19	82	58	60	64	62	66	62	69	63	58	150	111	112	108	102
20	90	68	65	62	62	63	62	64	65	75	146	120	117	117	116
21	90	80	80	80	75	72	71	73	83		152	121	119	119	119
22	90	70	62	62	61	63	69	70	60	64	150	114	112	111	108
23	108	85	88	85	83	76	78	73	82		138	101	109	118	107
24	108	78	76	74	81	70	67	73	72	80	134	118	116	116	107
25	90	65	64	73	69	59	57	53	54	56	155	124	102	106	101
26	106	74	71	68	69	65	71	73	75	70	155	118	115	112	120
27	108	75	70	73	72	77	75	73	75	72	132	110	113	115	117
28	113	80	78	75	72	73	75	72	76	72	131	106	108	110	112
29	95	81	79	75	77	72	79	83	78	69	139	101	97	96	102
30	108	74	72	73	75	71	70	68	72	74	143	110	112	111	113

HEMODYNAMICS -GROUP B

SBP					DBP									
30	45	60	90	120	BI	AI	At 5 mins	10	15	30	45	60	90	120
126	125	126	122	133	98	92	96	90	85	78	81	89	87	80
128	129	123	125	133	91	81	78	75	74	71	70	72	78	81
101	99	99	107	103	67	66	66	68	64	72	71	70	73	69
117	116	110	107	110	92	69	85	69	76	83	82	80	76	85
112	115	114	121	117	84	81	84	86	86	85	86	86	87	80
126	132	134	134	134	98	82	78	84	78	88	94	82	82	82
121	123	128	116	122	90	80	83	84	82	85	84	89	88	84
120	115	108	121	136	95	78	94	94	91	94	82	88	88	95
116	117	128	121	116	80	76	72	70	68	75	72	78	73	70
104	108	110	110	106	72	68	73	71	70	71	60	75	67	68
108	106	108	112	107	88	76	75	72	74	68	65	66	70	71
107	109	105	109	102	96	88	82	81	81	80	78	74	75	72
114	112	104	114	106	92	80	83	80	78	68	68	72	72	70
128	121	118	122	123	92	83	82	84	88	86	80	79	75	75
133	133	129	128	134	96	87	88	95	95	94	93	93	92	91
112	124	121	112	119	95	75	74	76	67	74	86	75	79	85
104	118	124	128	130	96	85	87	77	92	78	82	85	80	92
102	99	99	104	107	92	84	83	80	79	78	72	75	78	78
118	123	124	134	136	93	77	76	74	76	75	78	74	86	86
127	128	126	124	119	89	83	82	83	81	88	88	83	89	81
128	126	115	130		97	88	87	88	85	91	90	82	93	
111	121	117	119	121	95	89	84	82	81	75	82	83	82	83
110	103	111	104		90	72	78	82	74	74	73	75	71	
112	113	114	105	110	84	63	68	68	63	64	59	70	57	66
112	121	117	122	122	90	84	65	66	66	54	76	75	59	71
121	123	120	128	124	92	82	80	82	78	72	74	70	74	72
115	114	115	112	108	98	72	88	82	82	82	84	83	83	83
112	116	113	114	113	77	72	70	71	73	78	79	75	70	81
121	121	121	105	108	77	75	72	71	74	78	85	89	80	80
118	119	122	123	124	95	78	84	82	75	82	82	87	86	86

MAP										VAS SCORE (POST OP)				
BI	AI	At 5 mins	10	15	30	45	60	90	120	0 MINS	30 MINS	60 MINS	90 MINS	120 MINS
115	103	107	101	97	94	96	101	99	98	1	2	2	2	2
114	97	93	90	92	90	90	89	94	98	3	3	3	3	3
82	80	80	82	76	82	80	80	84	88	2	2	2	2	2
107	97	98	77	77	94	93	90	86	93	2	2	2	3	3
96	91	94	95	95	94	96	95	98	92	1	2	2	2	2
109	91	87	92	87	101	105	92	92	92	2	2	2	2	3
115	95	96	96	94	97	97	102	97	97	3	3	3	3	3
110	105	101	104	102	102	93	95	101	109	2	2	2	2	2
98	92	87	85	83	89	87	95	89	85	3	3	3	3	3
96	77	81	80	78	80	74	83	81	76	1	2	2	2	2
103	86	86	85	87	81	79	80	84	83	1	1	1	1	2
108	99	96	95	93	89	88	84	86	82	1	1	1	1	2
111	92	97	91	93	83	83	83	86	82	1	1	1	1	2
111	96	96	97	100	100	94	92	91	91	1	1	1	1	2
113	99	100	107	107	107	106	105	104	105	1	1	1	2	2
113	88	88	76	77	87	99	90	90	96	1	1	1	1	3
119	75	108	80	105	85	94	101	96	105	1	1	1	2	3
105	92	91	88	87	86	81	82	87	88	1	1	1	1	2
112	88	84	82	80	89	93	91	103	103	1	1	1	3	3
108	95	94	94	93	101	101	97	101	94	1	1	1	1	2
115	99	99	98	96	103	102	93	105		1	1	1	1	2
113	97	94	92	90	87	95	94	94	96	1	1	1	1	2
106	82	88	94	85	86	84	87	82		1	1	1	1	2
103	76	79	79	81	75	68	77	74	77	1	1	1	2	2
112	93	76	73	74	62	94	86	94	82	1	1	1	1	2
113	94	92	92	92	88	90	87	92	89	2	2	2	3	3
109	85	96	93	94	93	94	94	93	91	1	1	1	2	2
95	83	83	84	86	89	91	88	85	92	1	1	1	2	2
98	84	80	79	83	92	97	100	88	89	1	1	1	2	2
111	88	94	92	88	94	95	99	98	99	2	3	3	3	3